3142

CCD-FX310/FX311
RMT-509

SERVICE MANUAL

US Model
CCD-FX310/FX311
Canadian Model
CCD-FX310

Remote commander is available as a unit, but as individual parts the battery case lid of commander is only avaiable.

Video 8
Handycam

A MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV" (9-973-199-11).

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 1.43 cm ($\frac{19}{32}$ inch)/sec. LP mode: Approx. 0.72 cm ($\frac{5}{16}$ inch)/sec. (playback only)
Recording time	SP mode: 2 hours (P6-120)
Playback time	SP mode: 2 hours (P6-120) LP mode: 4 hours (P6-120)
Fast forward/rewind time	Approx. 6 min. 30 sec. (P6-120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 8x power zoom lens f=6.1 to 48.8 mm ($\frac{1}{4}$ to $1\frac{15}{16}$ inches) Approx. 44 to 352 mm ($1\frac{3}{4}$ to $13\frac{7}{8}$ inches) converted into the focal length of a 35-mm still camera. F 1.6 with macro Filter diameter: 37 mm ($1\frac{1}{2}$ inches) TTL autofocus system inner focus wide macro system
Color temperature	AUTO
Minimum illumination	2 lx
Illumination range	2 lx to 100,000 lx (0.2 to 9294 footcandles)
Recommended illumination	More than 100 lx (9 footcandles)
Aperture correction	Automatic With backlight adjustment

Input and output connector

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack Output: –7.5 dBs, (at output impedance 47 kilohms) impedance less than 1 kilohms
RFU DC OUT	Special minijack, 5 V DC
Earphone jack	Minijack, 8-ohm impedance
Remote ⊂ jack	Stereo mini-minijack
MIC jack	Minijack, –66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

— Continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Power consumption	5.5 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 118 × 108 × 265 mm (w/h/d) ($4\frac{3}{4} \times 4\frac{3}{8} \times 10\frac{1}{2}$ in.)
Weight	Approx. 820 g (1 lb 13 oz) excluding the battery pack, lithium battery, and cassette Approx. 1012 g (2 lb 3 oz) including the battery pack NP-55, lithium battery CR2025, and cassette P6-120
Microphone	Electret condenser microphone, uni-directional, monaural type

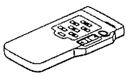
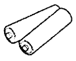
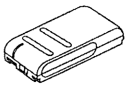
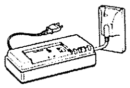
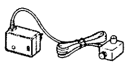
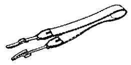
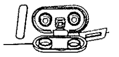
Wireless Remote Commander

Remote control system	Infrared control
Command mode	VTR 2
Power requirements	3 V DC, 2 size AA (R6) batteries
Dimensions	Approx. 48 × 19 × 130 mm (w/h/d) ($1\frac{15}{16} \times \frac{3}{4} \times 5\frac{1}{8}$ inches)
Weight	Approx. 50 g (1.8 oz) (excluding batteries)

Design and specifications are subject to change without notice.

Supplied Accessories

Check that the following accessories are supplied with your camcorder.

• Wireless Remote Commander (1) 	• Size AA (R6) battery for Remote Commander (2) 	• Battery pack NP-55 (1) 
• AC power adaptor AC-V35/V35A (1) 	• Lithium battery CR2025 (1) Change to plus side illus CR2025 SONY	• RFU adaptor RFU-90UC (1) 
• Shoulder strap (1) 	• Lens cap (1) (attached to the camcorder) 	• Jack cover (1) (attached to the camcorder) 

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

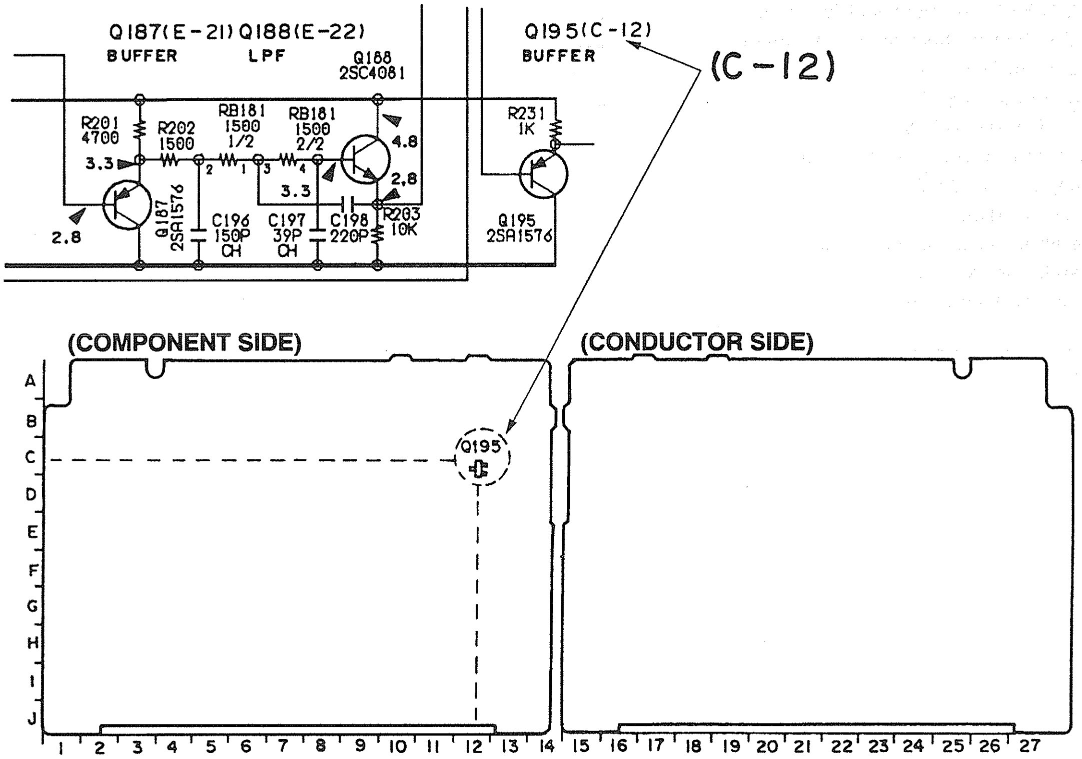
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 89 and 109.)
This diagram is useful for repair.


Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
4.8
2.8
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195(C-12)
BUFFER
R231
1K
Q195
2SA1576
(C-12)
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
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[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [✲] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

SECTION 1
GENERAL

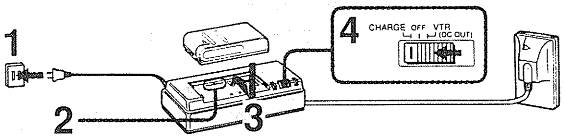
This section is extracted from instruction manual.

Chapter 1: Getting Started

Charging and Installing the Battery Pack

Before you can use this camcorder, you need to charge and install the battery pack.

Charging the Battery Pack



1 Plug the AC power adaptor into a wall outlet.
2 Align the flat side of the battery pack with the line on the AC power adaptor.
3 Push down and slide the battery pack in the direction of the arrow.
4 Set the CHARGE/VTR switch to CHARGE.

Required charging time:

Type of battery pack	NP-55 (supplied)	NP-77H/ NP-77HD	NP-77	NP-66H	NP-55H
Required charging time	60	140	120	100	70

(approx. minutes using AC-V35/V35A)

When charging is finished, the charge indicator will go out.

Important!

Use the battery completely before recharging!

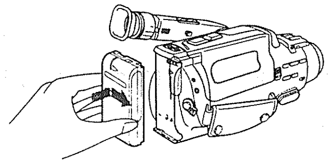
Before you recharge the battery, make sure the battery has been used (discharged) completely. Excessive charging may reduce the charging capacity of the battery.

To use up the battery, remove the video cassette and set the POWER switch to CAMERA with the battery attached, and leave the camcorder until the ▭ indicator appears blinking and a red lamp blinks in the viewfinder.

Option AC-S10 AC power adaptor:
This adaptor has a function which allows you to confirm that the battery is completely discharged and ready to be recharged to its full capacity.

Installing the Battery Pack

When you have finished charging the battery, install the battery pack as follows:

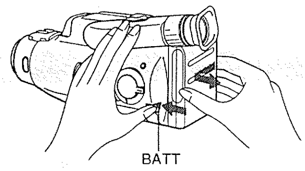


1 Align the flat side of the battery pack with the white line on the camcorder.
2 Make sure that the arrow on the battery pack is close to the top of the camcorder.
3 Push down and slide the battery pack in the direction of the arrow.

Notes
- Make sure the battery is securely installed so that it does not fall off. If the battery is not installed properly, the camcorder will not record accurately.
- You can use the AC power adaptor as a power source when recording indoors.

Removing the battery pack

Slide the BATT switch in the direction of the arrow, and at the same time, slide out the battery pack to the left.



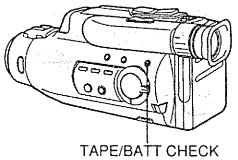
Battery life and remaining capacity

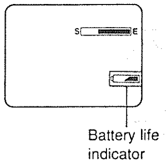
A fully charged battery pack lasts for:

Type of battery pack	NP-55 (supplied)	NP-77H/ NP-77HD	NP-77	NP-66H	NP-55H
Battery life	60	150	120	110	75

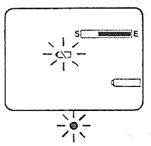
(approx. minutes, continuous recording when used indoors)

To check the remaining battery capacity, set the POWER switch to CAMERA, set the STANDBY switch up and press TAPE/BATT CHECK.





The decreasing black bar indicates decreasing battery power. After the black bar disappears the ▭ indicator will appear and blink and a red lamp will also blink in the viewfinder. When they blink rapidly, replace the battery pack.

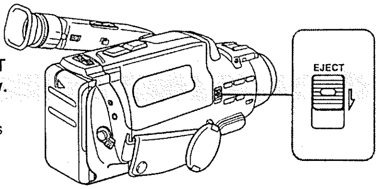


Notes
- The battery life indicator of the camcorder may indicate a different remaining capacity from that of the NP-77HD battery pack.
- Charge the battery pack when the black bar of the battery life indicator decreases quickly.

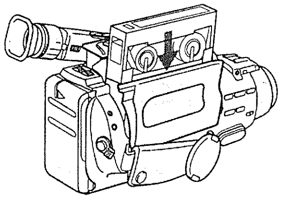
Inserting a Tape

Make sure that the battery pack or another power source is attached.

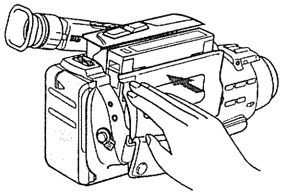
1 Press the small blue button on the EJECT switch and simultaneously slide EJECT in the direction of the arrow.
The cassette compartment automatically lifts up and opens toward you.



2 Insert a tape with the window facing outside.

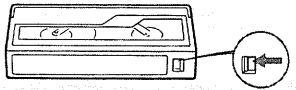


3 Close the cassette holder by pressing the area on the cassette compartment marked "PUSH".



Preventing Accidental Erasure

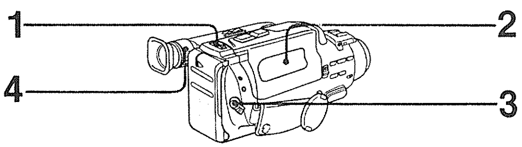
Slide the red tab closing the window to prevent accidental recording. To re-record on the tape, slide the tab opening the window.
If you try to record with the red mark exposed, the 📼 and ⏏ indicators flash in the viewfinder and beeps sound for about 5 seconds.



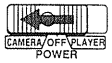
Notes on handling tapes
Don't insert anything in the small holes on the rear of the cassette. These holes are used to sense the type and thickness of tape, or if the red mark is exposed or covered, etc. Store tapes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

Adjusting the Viewfinder Lens

Before using your camcorder for the first time or after another person used it, adjust the viewfinder lens to best fit your eyesight. Make sure that a battery pack or another power source is attached to the camcorder.

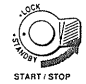


1 Press the small green button on POWER and set the POWER switch to CAMERA.

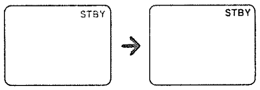


2 Insert a tape.
(See page 8.)

3 Set the STANDBY switch up.



4 Turn the viewfinder adjustment ring around the viewfinder lens until the "STBY" indicator displayed in the viewfinder screen comes into sharp focus.

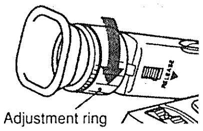


Using the viewfinder as a sports finder

Your camcorder is equipped with a Sports Finder. You can use the viewfinder as the sports finder by turning the viewfinder adjustment ring.

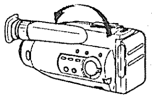
What is a sports finder?
Since this finder has a long focal length, you can monitor the picture while your eye is at a distance from the eyecup. The sports finder is convenient when moving around to shoot scenes.

Setting the viewfinder to the sports finder position
Turn the viewfinder adjustment ring clockwise completely.



Returning from the sports finder position to the normal viewfinder position
Turn the adjustment ring counterclockwise until the word "STBY" that appears in the viewfinder comes into sharp focus.

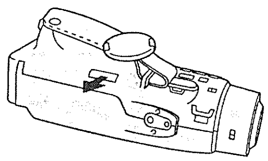
When storing your camcorder
Turn the viewfinder barrel to the front.



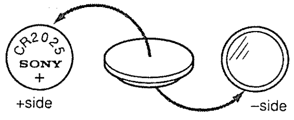
Installing the Lithium Battery

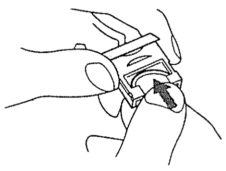
To keep birth dates in the camcorder's memory and to activate the clock, the lithium battery must be installed.

1 **Remove the lithium battery holder located at the bottom of the camcorder.**



2 **Install the supplied CR2025 lithium battery with the + side facing down.**





3 **Put the lithium battery holder into the camcorder.**

Lithium battery life

The battery will last for approximately 1 year in normal operation.
When the lithium battery becomes weak, the ♁ indicator will blink in the viewfinder screen for about 5 seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025. Use of any other battery may present a risk of fire or explosion.**

When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, resetting the date, time and birth dates will be necessary.

Changing the lithium battery

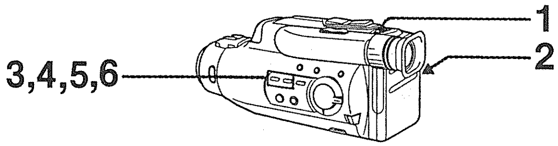
Remove the lithium battery holder from the camcorder, and pull out the lithium battery and insert a new one.

WARNING Battery may explode if mistreated.
Do not recharge, disassemble, or dispose of in fire.

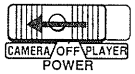
Cautions
- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, immediately consult a doctor.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.

Setting the Date and Time

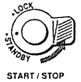
You need to set your camcorder's date and time to be able to superimpose the date and time onto your video.
Make sure that the power source and lithium battery are attached.



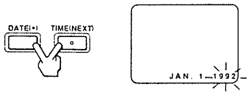
1 **Press the small green button on the POWER switch and slide the POWER switch to CAMERA.**



2 **Set the STANDBY switch up.**

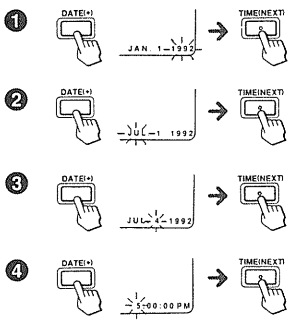


3 **Press DATE (+) and TIME (NEXT) simultaneously for a few seconds until the date indicator appears in the viewfinder.**
The DATE button now functions as + (to advance numbers) and the TIME button functions as NEXT (to set).

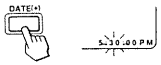


4 **Adjust the blinking digits of the year, month, day, and hour by using DATE (+), and by pressing TIME (NEXT).**

Notes
- When you keep DATE (+) pressed, the digits advance faster.
- The year starts at 1992 and proceeds as follows:
  1992--→1999→2000--→2020



5 **Adjust the blinking digits of minute by pressing DATE (+).**



6 **Press TIME (NEXT) to set the second to "00".**
The clock starts operating.

Correcting the date and time settings

Repeat steps 3 to 6.

Storing a Birth Date in Your Camcorder

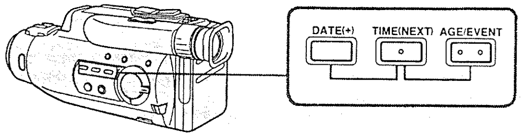
When you preset your child's birth date in your camcorder, you can put your child's age in years and months on your tape. You can also preset the date of an event. Once you enter the birth date of your child, the clock inside your camcorder will automatically update age of your child. You can superimpose the age anytime on your recording. You can preset up to three birth dates or events.

Before you begin

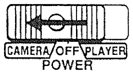
Before you store a birth date in your camcorder, make sure that power source is connected, that the lithium battery is installed and that the date is correctly set.

How to store birth date

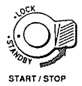
To store a birth date in your camcorder, see the following example and procedure.
Example: Store "Aug. 3, 1987" in memory 2.


DATE(+)
TIME(NEXT)
AGE/EVENT

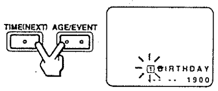
1 **Press the small green button on the POWER switch and slide the POWER switch to CAMERA.**


CAMERA/OFF/PLAYER
POWER

2 **Set the STANDBY switch up.**


LOCK
STANDBY
START/STOP

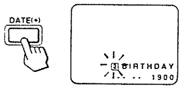
3 **Press TIME (NEXT) and AGE/EVENT simultaneously for a few seconds until the "1 BIRTHDAY--- --1900" indicator appears in the viewfinder.**


TIME(NEXT)
AGE/EVENT
1 BIRTHDAY
-- 1900

4 **Press DATE (+) to select 2.**

Each time you press DATE (+), the display in the viewfinder changes as follows:

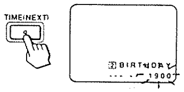
1 BIRTHDAY → 2 BIRTHDAY → 3 EVENT* → 1 BIRTHDAY


DATE(+)
2 BIRTHDAY
-- 1900

* Although "EVENT" is displayed on 3, you can use it for age as well.
1 and 2 can also be used to record event dates in memory.

5 **Press TIME (NEXT).**

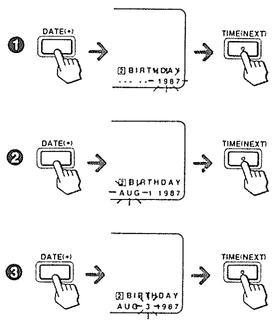
The "1900" indicator blinks.


TIME(NEXT)
2 BIRTHDAY
--- --1900

(continued)

6 **Enter the birth date.**

First adjust the blinking digits by pressing DATE (+), and then press TIME (NEXT).
The age (year and month) appears when all the items are adjusted.


❶
DATE(+)
2 BIRTHDAY
--- --1987
TIME(NEXT)
❷
DATE(+)
2 BIRTHDAY
AUG--1 1987
TIME(NEXT)
❸
DATE(+)
2 BIRTHDAY
AUG 3 1987
TIME(NEXT)

If you missed the correct number with DATE (+)

Keep pressing DATE (+).
The indicator changes as follows:

Year: 1900 → 1901 - - - → Current year
Current year – (minus) 99

Month: JAN. → FEB. - - - → DEC. → ---

Day: 1 → 2 - - - → 31

Correcting/changing the setting

Follow the procedures from step 1 again.

Advancing the digits faster

Keep DATE (+) pressed.

Presetting the year before 1900

1. After step 5 on page 12, keep pressing DATE (+) until the current year is displayed.
2. Press DATE (+) again.
   The year goes back 99 years.
   (example: 1992 → 1893)
3. Go to step 6 above.

When in 2000

"--- --1901" is displayed in step 3 on page 12. After that, it advances every year as "1902, 1903, ... ".

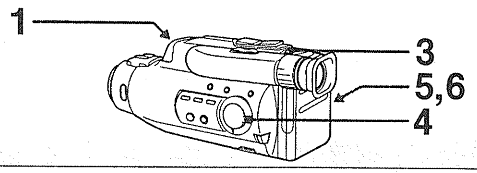
Now it's ready for recording!

Chapter 2: Basic Camera Operation

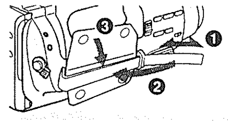
How to Record

Before you record one-time events, make a trial recording to make sure that your camcorder is working properly.
Keep the lens clean, or the focus cannot be adjusted properly.

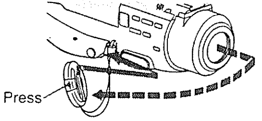
It is very easy to start recording scenes.



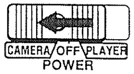
1 **Hold the camcorder by putting your hand through the grip belt so that your thumb can easily press the red START/STOP button.**



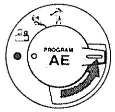
2 **By pressing the release on the lens cap, remove and attach it to the grip belt.**



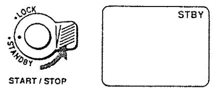
3 **Press the small green button on the POWER switch and slide the POWER switch to CAMERA.**
This puts the camcorder in the camera recording mode.



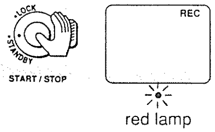
4 **Set the PROGRAM AE (Auto Exposure) switch to the green position.**



5 **Set the STANDBY switch up.**
"STBY" appears in the viewfinder. Now, you can see through the viewfinder.



6 **Press START/STOP (red button) once.**
The camera is recording when the word "REC" appears on the viewfinder screen and the red lamp lights in the viewfinder.
You can also confirm the start of recording with beep sound when you have the BEEP switch turned on.



In the viewfinder you can see a black and white picture of what you are recording and information that indicates what the camcorder is now doing.

Automatic recording

With the PROGRAM AE switch set to the green position, all the camera functions are on automatic (i.e. auto iris, auto white balance, auto focus) and the shutter speed is set at normal (1/60 second).

To stop recording momentarily

Press START/STOP again. "STBY" appears in the viewfinder. The camcorder beeps twice when you have BEEP turned on.

When you have finished recording

Turn the STANDBY switch down and slide the POWER switch to OFF.

Ejecting the tape

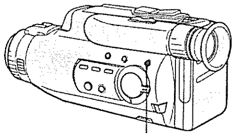
Make sure that you have attached the battery pack or other power source to the camcorder.

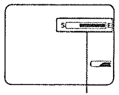
1 Press the small blue button on the EJECT switch, and at the same time push EJECT in the direction of the arrow.
2 Take out the tape.
3 Close the cassette holder by pressing the area marked PUSH on the cassette compartment.

Caution!
Please remember that you can only use 8-mm format video tapes with this camcorder.
You will be able to record tapes in SP (standard play) mode only and play back tapes in both SP and LP (long play) modes.

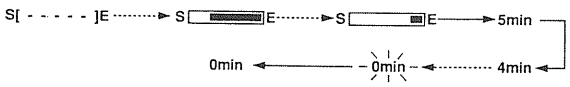
Checking the time remaining on the tape

Press TAPE/BATT CHECK.


TAPE/BATT CHECK


Tape length indicator

After pressing TAPE/BATT CHECK, the time remaining may not be indicated for about 20 seconds. When the time remaining is less than about 5 minutes, the indicator displays the minutes remaining.



When "5 min" lights, the ▭ indicator appears in the viewfinder and blinks.

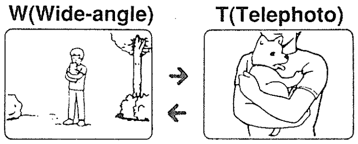
Note on the tape length indicator
- The camcorder must be in the recording or playback mode when the TAPE/BATT CHECK is pressed to find out the time remaining. In the playback mode, however, the indicator does not indicate the minutes remaining.
- The tape length indicator does not change while using EDITSEARCH.

Using Zooming Features

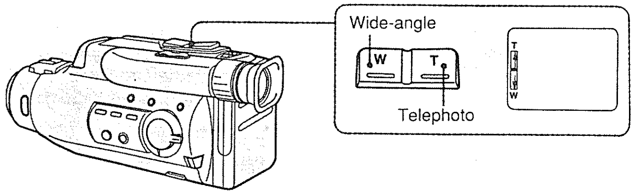
You can create a professional-looking home video using these sepcial effects; zoom, close-up, fade-in and fade-out.

Zooming

Zooming is a recording technique that lets you change the size of the subject in the scene. Use "Zoom-in (telephoto)" for dramatic close-ups, and "zoom-out (wide-angle)" for panoramic long shots. You can also use zooming to focus manually or to decide on a shooting angle. For more professional-looking recordings, use zooming sparingly.



To zoom



Two-level Speed Zooming

The camcorder's power zoom button offers two-level speed zooming. Press it firmly for high speed zooming and softly, for relatively slow zooming.
Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

Focusing in Macro

Even small subjects such as flowers, insects, and images in photographs, can literally fill the screen using focus in macro.

1 **Bring the camcorder as close as necessary to obtain the desired suuject size.**
2 **Press the W side of the power zoom button until the indicator in the viewfinder stops at the W end.**

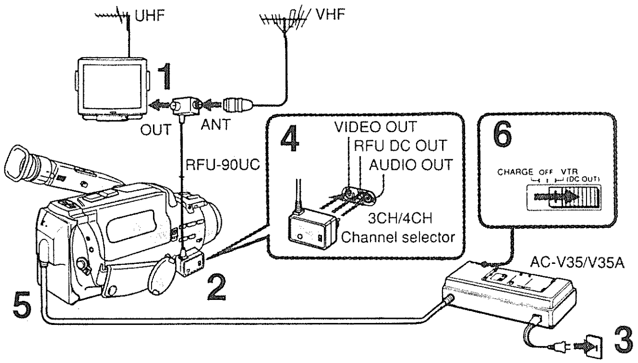
Note — You can shoot a subject that is at least 1 m (about 39$^3/_8$ iches) away from lens surface in the telephoto position.

Playing Back a Tape

You can use this camcorder as a VCR by connecting it directly to your TV for playback. After you connect this camcorder to your TV, use the Remote Commander for convenient control of the camcorder.

If Your TV Has Only an Antenna Input

Use the supplied RFU adaptor to connect your camcorder to your TV. Before connecting, make sure that the TV is turned off to prevent speaker damage. **If your TV has audio/ video inputs. see page 33.**



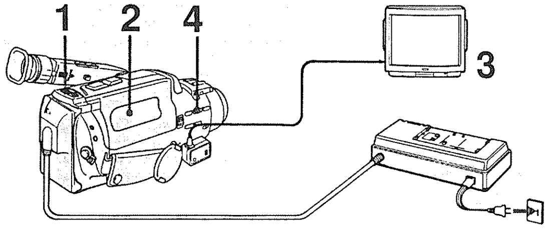
To connect your camcorder to a TV that is already connected to a regular TV (VHF) antenna, you need to:

1 Unplug the antenna cable from your TV first.
  Plug in the tail end of the RFU adaptor marked OUT to the antenna input of your TV. Re-wire the antenna cable you unplugged to the RFU adaptor jack marked ANT. This way, you can switch between TV broadcasting and your home video playback without re-wiring.
2 Connect the RFU adaptor to the camcorder.
3 Connect the AC power adaptor to a wall outlet.
4 Set the channel selector on the RFU adaptor (and your TV channel) to 3 CH or 4 CH of the VHF channel, whichever is not active (vacant) in your area.
5 Attach the connecting plate of the AC power adaptor to the camcorder.
6 Make sure the CHARGE/VTR selector on the AC power adaptor is set to VTR position.

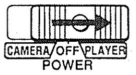
Note — When you want to switch to a reguler TV program, set the CHARGE/VTR selector to OFF or turn off the power on the camcorder.

Playing Back a Tape

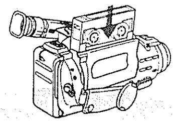
How to Play Back a Tape



1 **Press the small green button on the POWER switch and set the POWER switch to PLAYER.**



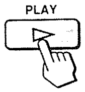
2 **Insert a tape. (See page 8.)**



3 **Turn on the TV and select the channel to which you adjusted the RFU adaptor (3 CH or 4 CH).**

If you are connecting with audio/video inputs, set your TV's TV/VIDEO selector to VIDEO.

4 **Press ▷ (PLAY).**



To stop playback, press □ (STOP).
To rewind the tape, press ◀◀ (REW).
To advance the tape rapidly, press ▶▶ (FF).

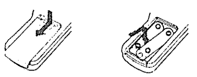
When you have finished playback

1. Eject the tape, see page 15.
2. Slide the POWER switch to OFF.
3. Set the CHARGE/VTR switch on the AC power adaptor to OFF.

Using the Remote Commander

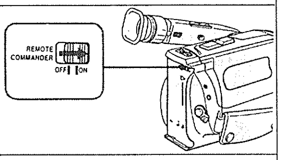
By using the Remote Commander, you can be in the picture with your friends and family, or conveniently control the playback of your tape from a distance.

1 **Insert two size AA (R6) batteries with the + and – ends properly positioned.**



2 **Set the ◙ REMOTE COMMANDER switch on the battery mounting surface of the camcorder.**

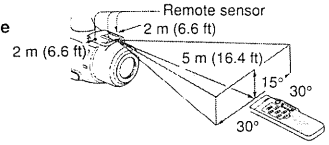
If the battery is attached, remove it.
Reattach the battery after setting the REMOTE COMMANDER ON/OFF switch.



3 **Set the POWER switch on the camcorder as follows:**

— When camerarecording, 1) press the small green button on the POWER switch and slide it to CAMERA, 2) set the STANDBY switch up.
— When playing back, slide the POWER switch to PLAYER.

4 **Aim the Commander at the remote sensor on the camcorder and press the appropriate button on the Commander.**



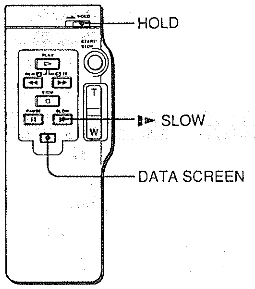
(Approximate maximum distance and angles for remote control)

Note on the Remote Commander

- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Remote control with the Commander may not function properly ander such circumstances.
- The command mode of the Commander is VTR2. Avoid using the Sony VCRs with the same command mode at the same time.

Getting familiar with some buttons

HOLD switch
When you slide the switch in the direction of the arrow, all the buttons will become inoperable to prevent any misoperation should you accidentally press the buttons.
▮▶ SLOW and DATA SCREEN buttons
You can use the functions of these buttons only with the Commander.



Battery life In normal operation, batteries last up to six months. If the camcorder does not operate properly, the batteries might be exhausted. Replace both batteries with new ones.

To avoid damage from possible battery leakage

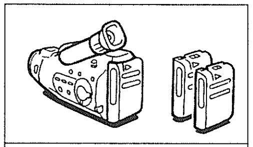
Remove the batteries when you will not use the Commander for a long time.

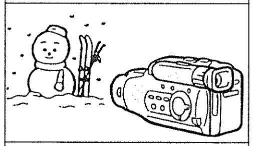
When you connect the receiver of a remote control kit

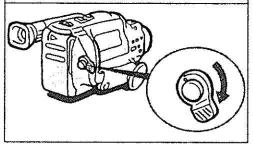
When you connect the receiver of a remote control kit (not supplied) to the REMOTE ◐ control connector, be sure to set the ◙ REMOTE COMMANDER switch on the battery mounting surface of the camcorder to OFF.

Getting the Most out of Your Battery Pack

How to Prepare the Rechargeable Battery Pack







Have sufficient battery pack power to do 2 or 3 times as much recording than you have planned.

"Battery life" indicated in this manual is measured by the continuous recording time of the camcorder, placed at room temperature using a fully-charged battery.

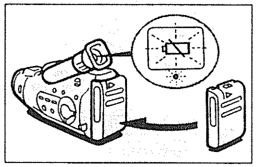
Battery life is shorter in cold climates.

Battery efficiency is decreased and the battery will be used up more quickly.

Set the STANDBY switch of the camcorder down when not recording to save battery power.

A smooth transition between scenes can be made even if recording is stopped and started again.
While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically inside the camcorder and the battery is used.
The battery is also used when a tape is inserted or removed.

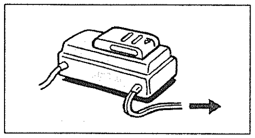
When the Rechargeable Battery Pack Should Be Replaced



When the ▭ indicator and red lamp in the viewfinder change from slow blinking to rapid blinking while you are recording.

Turn off the power switch of the camcorder and replace the battery pack.

Notes on Charging



Before using the battery pack, charge it sufficiently.

A brand new battery pack is not charged.

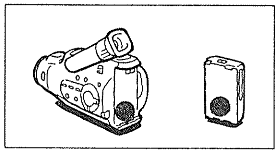
Make sure you use up the battery before recharging.

- If recording is completed before the ▭ indicator appears in the viewfinder, it is recommended that you remove the tape, set the POWER switch to CAMERA, turn the STANDBY switch up, and leave the camcorder on until the ▭ indicator blinks rapidly.
- When you use the AC-S10 AC power adaptor, the DC-S10 car battery charger or BC-S10 portable battery charger, you can discharge the battery with their discharging function.
- **Repeated charging without using up the battery may cause lowering of battery capacity. However, the original battery capacity can be recovered if you fully discharge (use up) and charge the battery again.**

Recharge the battery pack after long storage.

If the battery pack is fully charged but not used for a long time (about 1 year), it becomes discharged. Charge it again but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

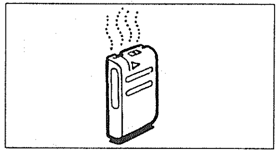
Keep the Terminals Clean



If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.

When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Notes on the Rechargeable Battery Pack

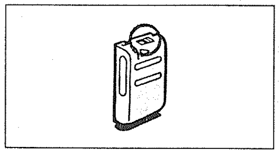


Why the battery pack heats up?

During charging or recording, the battery pack heats up. This means energy has been generated and chemical change has occurred inside the battery pack, and this is not dangerous.

How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is in the camcorder, a small amount of current flows to the camcorder even if it's turned off. This gradual discharge shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus, it is recommended you charge the battery right before using.



How to use the switch on the battery pack

This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

How many times can the battery pack be recharged?

The battery pack can be fully charged and discharged about 500 times under normal temperatures.
If the ▭ indicator blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Recommended temperatures during charging

Charging under temperatures ranging from 10°C to 30°C (5°F to 85°F) is recommended. Lower temperatures require a longer charging time.

Chapter 3: Advanced Camera Operation

Connecting Alternative Power Sources

You can choose any of the following power sources for your camcorder: battery pack (see page 6), house current, and 12/24 V car battery.
The appropriate power source for you to choose depends on the place where you want to use your camcorder.

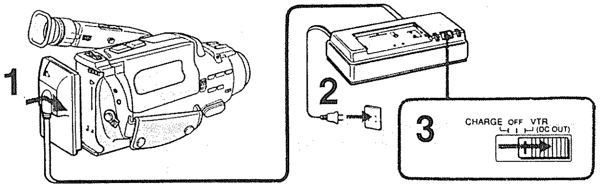
Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-77H/77HD, NP-77, NP-66H or NP-55H
Indoors	House current	AC power adaptor AC-V35/V35A (supplied), AC-V30 or AC-S10
In the car	12 V or 24 V car battery	DC pack DCP-77

Note on power sources

Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. In this case, supply the power again immediately.

Using House Current

The supplied AC-V35/V35A AC power adaptor is required.



1 **Align the flat side of the connecting plate with the white line on the camcorder, and push down and slide it in the direction of the arrow.**

2 **Connect the AC power adaptor to a wall outlet.**

3 **Set the CHARGE/VTR selector of the AC power adaptor to VTR.**

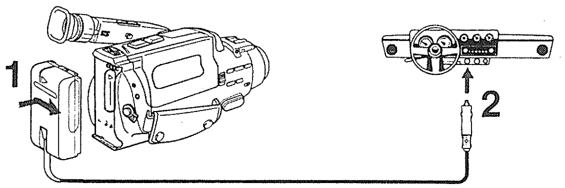
See the instruction manual of the AC power adaptor for details.

To remove the connecting plate

Remove it in the same way as you do with the battery pack. See page 7.

Using Car Battery

The DCP-77 DC pack (not supplied) is required.



1 **Align the flat side of the DC pack with the white line on the camcorder, and push down and slide it in the direction of the arrow.**

2 **Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V).**

To remove the DC pack

Remove it the same way as you do with the battery pack. See page 7.

Options

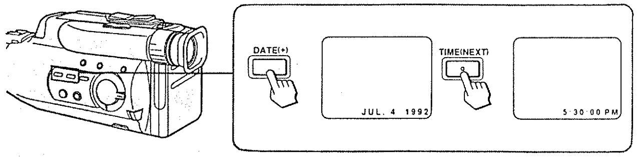
- BC-77, BC-S10 portable battery charger:
  You can charge a battery pack on 100 – 240 V AC. BC-S10 has a discharging function, so you can charge a battery pack whether or not it is used up.
- DC-S10 car battery charger with discharging function:
  You can charge a battery pack through the cigarette lighter socket.

Camera Recording

In the previous chapter "Basic Camera Operation", you learned the basic recording operations. This section shows you how to record the date or time, record an age, re-record a picture and more.

Recording the Date or Time

Date or time can be superimposed on your recording.



During camera recording or when in standby mode, press DATE for date indication or TIME for time indication.

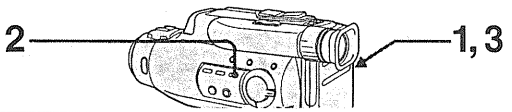
The date or time displayed in the viewfinder is recorded with the picture.

To stop recording date or time

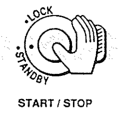
Press DATE or TIME again.
The picture recording continues.

Putting an Age on Your Tape

Here's how to put the age of your children in your video while recording.



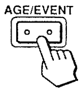
1 **During recording, press START/STOP at the point where you want to insert the age of a person or the elapsed time.**
This puts the camcorder in the standby mode.



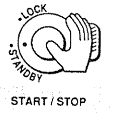
2 **Press AGE/EVENT to select the indicator you want to record.**
Each time you press AGE/EVENT, the indicator changes as follows:

No indicator → [1] The first age
↑ ↓
[3] The third age ← [2] The second age

An item with no presetting is skipped.
The [1], [2], or [3] indicator goes out after one second.



3 **Press START/STOP.**
Recording starts again.
The indicator in the viewfinder is recorded with the picture.



Note
You cannot add the age later during playing back or editing.

To stop recording the age

Press AGE/EVENT until the indicator goes out.

To change the display while recording

Press AGE/EVENT until the indicator you want to record is displayed. Recording of the indicator you select starts when [1], [2], or [3] goes out.

To cancel the stored birth date

1 Perform steps 1 to 4 in "Storing a Birth Date in Your Camcorder" on page 12, to select the memory number to be canceled.
2 Press TIME (NEXT) twice. The month indicator blinks.
3 Press DATE (+) until "--- --" appears.
4 Press TIME (NEXT).

The birth date is deleted from the memory and is not displayed when you press AGE/ EVENT.

About memory back-up

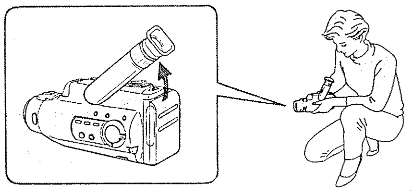
The camcorder uses the lithium battery on the bottom to keep the birth date in memory. The lithium battery life is approximately 1 year.

When you connect the camcorder to a TV during recording

If you do not use the data-screen function by the Remote Commander, the age indicatior will appear on the TV screen when the [1], [2], or [3] indicator goes out in the viewfinder and recording starts.

For Low-position Recording

You can also record from low position to get an interesting recording angle.

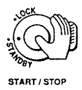


Set the viewfinder to the sports finder position (page 9) and turn it for the low position recording. (It can be turned 180 degrees.)

Checking the Last Portion of a Scene You Just Recorded (Rec Review)

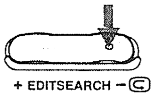
You can check the last portion of a scene you just recorded without changing the setting of the POWER switch using EDITSEARCH.

1 Put the camcorder in the standby mode by pressing the START/STOP button.



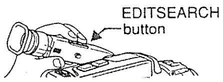
2 Press the – ⊜ side of EDITSEARCH momentarily.

The last few seconds of the recorded portion will be played back in the viewfinder. After a few seconds of playback, the camcorder goes back to the standby mode, ready for the next recording.



Note on using EDITSEARCH

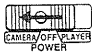
When you raise the viewfinder and use EDITSEARCH, hold the viewfinder with your thumb to prevent movement.



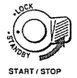
Checking Recording in the Viewfinder (EDITSEARCH)

You can check the recorded picture in the viewfinder using EDITSEARCH. Sound cannot be monitored.

1 Press the small green button, and slide the POWER switch to CAMERA.

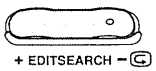


2 Set the STANDBY switch up.



3 Keep pressing the + or – side of EDITSEARCH to view the playback picture:

+ side for the playback picture
– side for the playback picture in reverse.



To stop playback

Release EDITSEARCH.

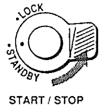
To monitor the sound while viewing the playback picture in the viewfinder

1 Connect an earphone to the ◎ (earphone) jack.
2 Press the small green button and slide the POWER switch to PLAYER.
3 Press ◀◀ to rewind the tape and press □ where you want to stop.
4 Press ▷ to start playback.

Re-recording on a Previously Recorded Portion (EDITSEARCH)

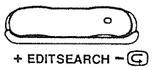
You can reshoot a scene over the last recorded portion using EDITSEARCH. The previously recorded portion will be erased.

1 Set the STANDBY switch up.



2 Look in the viewfinder and find the point from where you want to begin recording by:

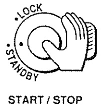
Keep pressing the + side of EDITSEARCH continuously to advance the picture at a normal playback speed, or the – side to reverse the picture.



3 At the desired point, release EDITSEARCH.

4 Press START/STOP.

Recording begins from the point you released EDITSEARCH. A smooth transition between scenes can be made after the pre-recorded portion even if STANDBY is turned down and turned up, or even if the power is turned off and on again, provided that the tape is not removed.



To pause recording

Press START/STOP again.

To stop recording

Set the STANDBY switch down.

Helpful Hints for Recording

If the tape reaches near the end during recording

The ⊡ indicator and the red lamp in the viewfinder and the camera recording/battery lamp on the camcorder blink slowly. When the tape reaches its end, blinking becomes rapid and beeps sound for about five seconds (if BEEP is set to ON).

Notes on recording

- To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- When moving from indoors to outdoors, or vice versa, turn STANDBY up and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.

Note on standby mode

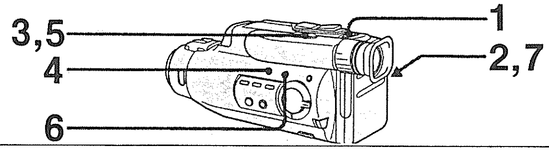
If you leave the camcorder in the standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume the standby mode, turn STANDBY down and turn it up again. To start recording, press START/STOP directly.

Note on light sources

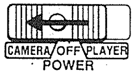
If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder in the other direction.

Inserting a Scene in the Middle of a Recorded Tape

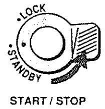
You can insert a scene in the middle of a recorded tape by setting the starting point and ending point. A previously recorded portion will be erased.



1 **Press the small green button and slide the POWER switch to CAMERA.**

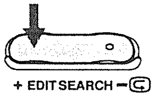

CAMERA/OFF/PLAYER
POWER

2 **Set the STANDBY switch up.**


LOCK
STANDBY
START / STOP

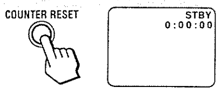
3 **While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.**

The camcorder enters the standby mode again.

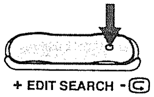

+ EDITSEARCH –

4 **Press COUNTER RESET.**

The counter is reset to zero.

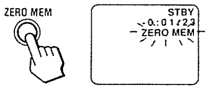

COUNTER RESET
STBY
0:00:00

5 **While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.**


+ EDIT SEARCH –

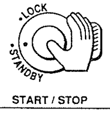
6 **Press ZERO MEM.**

The insert ending point is stored in memory.


ZERO MEM
STBY
-0:01:23
ZERO MEM

7 **Press START/STOP.**

Insert recording begins. The insert recording stops automatically at the counter zero point.


LOCK
STANDBY
START / STOP

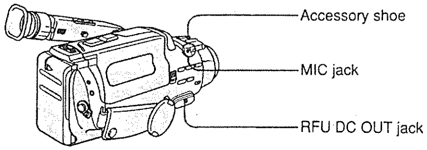
To cancel the ZERO MEM

Press ZERO MEM.

Note The picture may be distorted at the ending point when played back.

Recording with an External Microphone

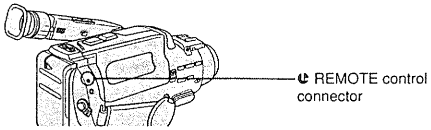
You can connect an external microphone (not supplied) to the MIC jack. This jack also accepts a "plug-in-power" microphone.
Attach the microphone to the accessory shoe of the camcorder.
If the microphone has two plugs, connect the DC IN plug to the RFU DC OUT jack on the camcorder.


Accessory shoe
MIC jack
RFU DC OUT jack

Note When recording with an external microphone, wind noise is not muted.

Connecting a Wired Remote Control Unit

When you connect a wired remote control unit or editing controller (not supplied) to the ᑕ REMOTE control connector, you can operate your camcorder from a distance.


ᑕ REMOTE control connector

About ᑕ (LANC)

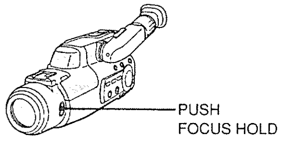
ᑕ stands for Local Application Control Bus System. The ᑕ connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

Manual Adjustments

The camcorder's automatic functions offer you worry-free operation under most shooting conditions. But in some circumstances, manual adjustment is better for effective recording. You can manually maintain focus and compensate for backlighting with this camcorder. Some shooting situations may call for using some items manually, while others may call for using them automatically.
The previous manual settings are retained, as long as you do not remove the battery, even if you set the POWER switch to OFF.

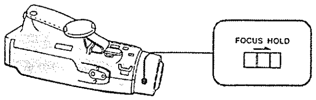
Maintaining Focus

Your camcorder may automatically refocus on a subject other than the desired subject.
In such cases, use the PUSH FOCUS HOLD button or the FOCUS HOLD switch to keep the desired subject in focus.



Hold down the PUSH FOCUS HOLD button.
The focus is maintained and the ◎ indicator is displayed while you hold down this button.

To maintain the focus without having to keep pressing the PUSH FOCUS HOLD button, use the FOCUS HOLD switch:



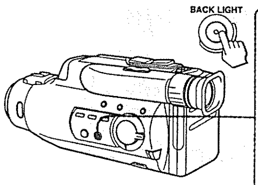
While pressing the PUSH FOCUS HOLD button, slide the FOCUS HOLD switch in the direction of the arrow. You may now release the PUSH FOCUS HOLD button. Your camera's focus is held and the ◎ indicator appears in the viewfinder.

To resume automatic focus, slide the FOCUS HOLD switch in the opposite direction of the arrow.

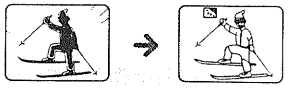
Note
When using a Sports Pack or Marine Pack, set the FOCUS HOLD switch in the direction of the arrow.

Compensating for Backlighting

In this camcorder, the exposure is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button to get natural exposure.



Press BACK LIGHT.
The ▨ indicator appears. If it does not appear, press the button again.



Subject is too dark because of backlight. → With backlight compensation.

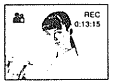
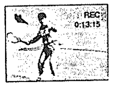
After shooting

Be sure to release this adjustment condition by pressing BACK LIGHT again.
(The ▨ indicator goes out.)
Otherwise, the picture will be too bright under normal lighting condition.

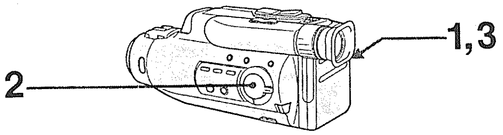
Using Program AE (Auto Exposure)

When you use the PROGRAM AE (Auto Exposure) function, you can give a "portrait" effect (the object is in focus and the background is out of focus) or capture high-speed action with "sports" mode or "high speed shutter" mode. Select from three types of mode referring to the following table.

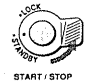
To choose best programmed AE mode

When shooting:	Select:
• A still subject such as person or a flower • Zooming in a subject in the telephoto mode • A subject behind such obstacle as a net	👤 (Portrait mode) 
• Outdoor sports scene such as football, tennis or golf • A landscape in a moving car	🏃 (Sports mode) 
• A golf swing or a tennis match with the tennis ball captured clearly • Playing back certain scenes with high speed movements in a clear, sharp picture	🏌 (High speed shutter mode)

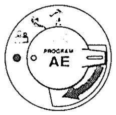
Selecting the PROGRAM AE Mode



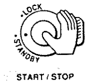
1 **Set the STANDBY switch up.**



2 **Set the PROGRAM AE switch to 👤, 🏃, or 🏌 to the desired setting.**
👤, 🏃, or 🏌 appears in the viewfinder.



3 **Press START/STOP.**
Recording with the portrait, Sports, or high-speed shutter mode starts.



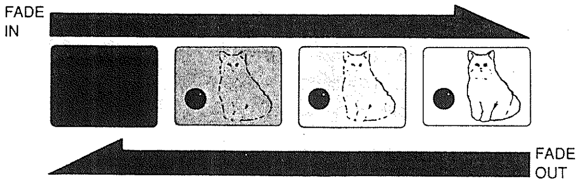
To resume the automatic mode

Set the PROGAM AE switch to the green position.

Notes
- When recording under fluorescent, sodium, or mercury lamp, the brightness of the recorded picture may vary, or the color of the recorded picture may become unnatural.
- The shutter speed in each PROGRAM AE mode is as follows:
  Portrait mode – between 1/60 to 1/2000
  Sports mode – between 1/60 to 1/1500
  High speed shutter mode – 1/4000

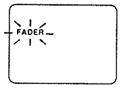
Fade-in and Fade-out

You can fade-in or fade-out to give your recording a professional appearance.
When fading-in, the picture will gradually appear from black.
The sound will also gradually increase.
When fading-out, the picture will gradually fade to black. The sound will also decrease.

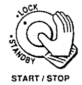


When fading-in

1 Press FADER after setting the STANDBY switch up to put the camcorder into standby mode.
The FADER indicator starts blinking.

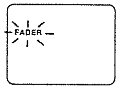


2 Press START/STOP.
The FADER indicator stops blinking and the recording starts fading in.

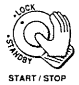


When fading-out

1 Press FADER while recording.
The FADER indicator starts blinking.



2 Press START/STOP.
The FADER indicator stops blinking and the picture fades out and the recording stops.



To cancel the fade-in/out function

Before pressing START/STOP, press FADER again.

Using the fade-in/out function repeatedly

Start from step 1 each time.

When the date/time (page 24), or age (page 24), is displayed

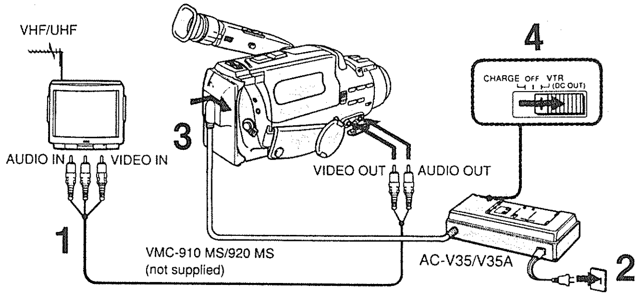
The date/time, or age does not fade-in or fade-out.

Playing Back

In the earlier section (page 17) we explained the basic connection to your TV with the RFU adaptor. In this section we discuss several other ways of connecting to your TV.

Connecting a TV with Audio/Video Inputs

There are several ways to connect your camcorder to your TV. If your TV has audio/video inputs, use an A/V cable. Before connecting, make sure that your TV is turned off to prevent speaker damage. **If your TV has only an antenna input, see page 17.**

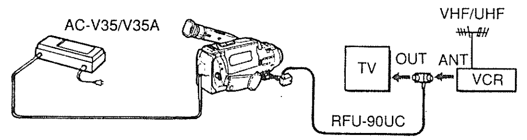


1 Use an A/V cable to connect your TV and camcorder:
  [a] If your TV is a stereo type, use the VMC-910MS/920MS A/V connecting cable (not supplied).
  [b] If your TV is a monoaural type, use the VMC-710M/720M A/V connecting cable (not supplied).
2 Connect the AC adaptor to a wall outlet.
3 Attach the connecting plate of the AC power adaptor to the camcorder.
4 Set the CHARGE/VTR selector on the AC power adaptor to VTR (DC OUT).

Connecting to a TV via a VCR

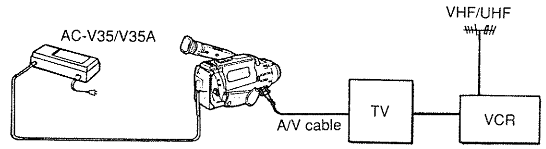
If your TV has no AUDIO/VIDEO input jacks

Disconnect the antenna connection between the TV and the VCR, and connect the RFU adaptor to the VHF/UHF input of the TV and VHF/UHF output of the VCR.



If your TV has AUDIO/VIDEO input jacks

Connect Audio and Video from the camcorder to the VCR instead of to the TV. Set the input selector of the VCR to LINE, if available.

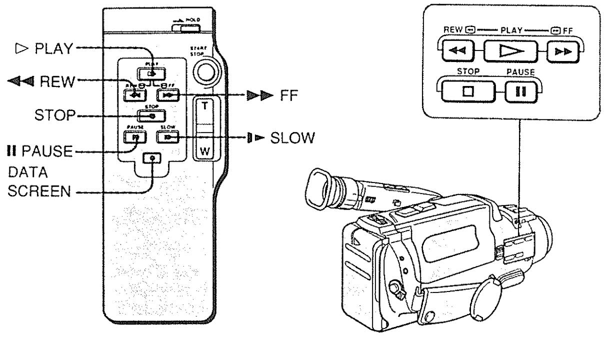


Playing Back a Tape in Various Speeds

The supplied wireless Remote Commander is useful to control the camcorder from a distance. When using it, be sure to set the ▣ REMOTE COMMANDER ON/OFF switch to ON.

To make the same indications in the viewfinder on the TV (only on the Commander)

Press DATA SCREEN.
To turn the indications off, press it again.
This DATA SCREEN on TV will tell you which playback mode you are using.



To view the still picture (playback pause)

Press **II** during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ or **II**.

Note
When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

To view the picture at 1/5 speed (slow playback) (only on the Commander)

Press I▶ during playback .
I▶ appears in the viewfinder.

Note
To resume normal playback, press ▷.
When slow playback lasts for 1 minute or more, the playback at the normal speed starts automatically.

To locate the desired scene (picture search)

Keep pressing ◀◀ or ▶▶ during playback or in the still picture mode. ⏪ or ⏩ appears in the viewfinder.
To resume normal playback, release the button.

To locate the desired scene quickly (skip scan)

Press ◀◀ during rewinding or ▶▶ during advancing the tape rapidly. ⏪ or ⏩ appears in the viewfinder.
To resume normal playback, press ▷.

About the playback picture

During the various playback modes, streaks appear on the screen.

Playing back

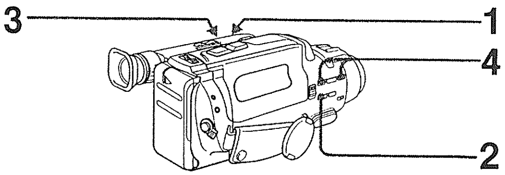
Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

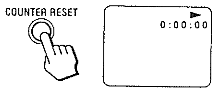
To count the whole tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00". Write down the counter reading at a particular point so that you can easily find that point later by referring to the tape counter.

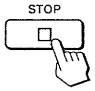
To return to a preset point



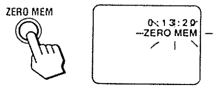
1 During playback, press COUNTER RESET at the point you later want to locate.
The counter shows "0:00:00".



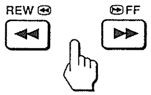
2 Press □ when the playback has finished, as usual.



3 Press ZERO MEM.
The "ZERO MEM" indicator blinks in the viewfinder.
Be sure to press ZERO MEM after you stop the tape. It does not function during recording or playback.



4 Press ◀◀ or ▶▶.
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.



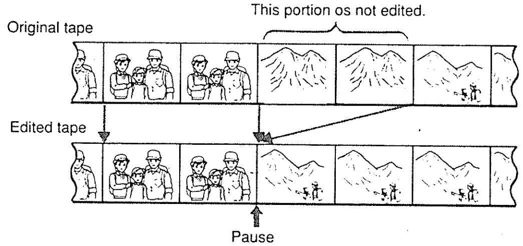
Notes on the tape counter and the ZERO MEM button

- Something must be recorded on the tape in order for the tape counter to function. The tape counter will not work on blank tape.
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide.
  There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to the point where you pre-registered.

Editing

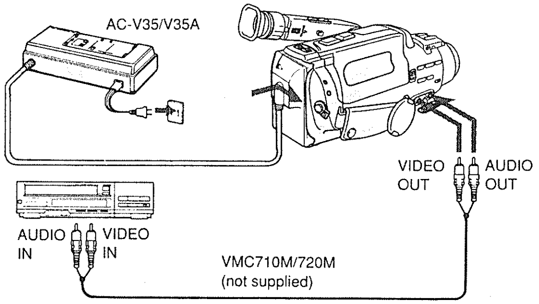
Editing Tapes with a VCR

You can edit a tape with an additional 8 8mm, β Betamax or VHS VHS format VCR.



How to connect

Make connections using the appropriate A/V cable (such as Sony VMC-710M/720M for monaural VCR or VMC-910MS/920MS for stereo VCR) and set the CHARGE/VTR selector on the AC power adaptor to VTR. Set the input selector of the VCR to LINE, if available.

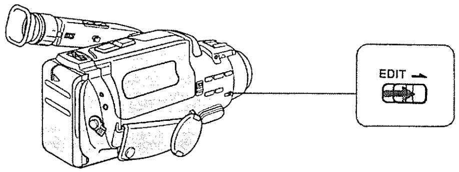


Editing

How to edit

1 **Insert a tape to be recorded into recording VCR.**

2 **Slide EDIT on the camcorder to the direction of the arrow.**



3 **Set the POWER switch of the camcorder to PLAYER, then insert the recorded tape.**

4 **Play back a tape on the camcorder until you locate the point where you want to start editing, then press II PAUSE to set the camcorder to the playback pause mode.**

5 **On the recording VCR, locate the recording starting point and set the VCR to the recording pause mode.**

6 **Press II PAUSE on the camcorder and VCR simultaneously to start editing.**

Editing more scenes

Repeat steps 4 to 6.

To stop editing momentarily

Press **II** PAUSE on the recording VCR.

To stop editing

Press ☐ STOP on both VCRs.

If you use the DATA SCREEN function

The indicators displayed on the TV screen will also be recorded. If you don't want to record these indicators, press DATASCREEN on the Commander.

Using of the EDIT switch

When you set EDIT to the direction of the arrow (EDIT ON), you can keep picture and sound deteriorations resulting from editing to the minimum. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

Chapter 4: Additional Information

Maintenance Information

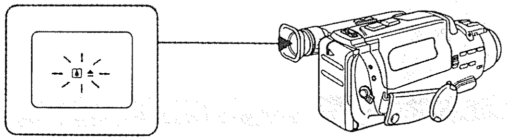
Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors.
However, take the following precautions.

How to prevent moisture condensation

When bringing your camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions. Be sure to tightly seal the bag. Remove your camcorder from the bag when the air in the bag reaches the temperature of its surroundings (after about one hour)

If moisture condenses inside the unit

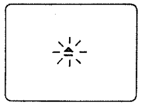


Moisture is present inside the camcorder when:
- The ▣ indicator in the viewfinder blinks.
  When the tape is inserted, the ⏏ indicator also blinks.
- Several beeps sound continuously for five seconds when the BEEP switch is set to ON and the tape is inserted.

In such cases, no functions except for tape ejection work.

Eject the tape, turn off the camcorder and leave it with the cassette holder open for at least 1 hour.
The camcorder can be used again if the ▣ indicator does not appear when the power is turned on again.

If moisture condenses on the surface of the tape



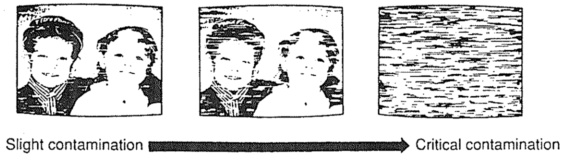
Moisture is present on the surface of the tape when:
- The ⏏ indicator blinks inside the viewfinder when the tape is inserted and a tape transport button (▷, ◀◀, etc.) is pressed.
- Several beeps sound continuously for about five seconds when the BEEP switch is set to ON.
  In such cases, no functions except for tape ejection work.

Eject the tape and let the camcorder and the tape sit for at least 1 hour.
The tape can be used again if the ⏏ indicator does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No caution indicators will appear, but the picture becomes dim.
Turn off the power and don't use the camcorder for at least 1 hour.

Video Head Cleaning



To ensure a clear picture, clean the video heads periodically

When playback pictures become noisy or hardly visible, the video heads may be contaminated. In such cases,

1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

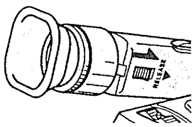
Caution Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

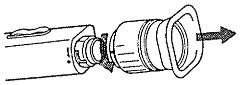
Viewfinder Cleaning

To clean the viewfinder

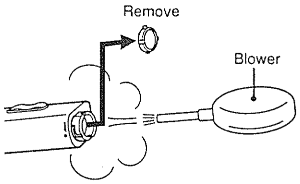
1 Pull the switch on the viewfinder barrel down.



2 Turn the eyecup in the direction of the arrow and detach the eyecup.

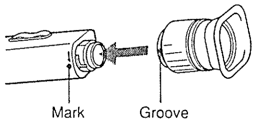


3 Clean the surface of the screen with a commercially available blower etc.

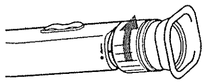


To reattach the eyecup

1 Align the groove on the eyecup with the ● mark on the barrel.



2 Turn the eyecup in the reverse direction of the arrow.



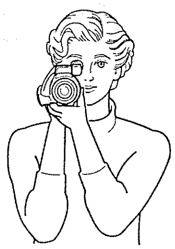
Tips for Better Camera Recording

How to Achieve Better Camera Recording

Take a good posture for shooting

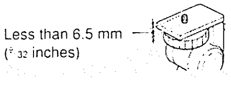
For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip belt so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Stand opposite to the subject and take a comfortable stance.
- Place your eye firmly against the viewfinder eyecup.



Use a tripod

If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

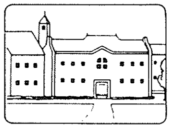


Caution
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm. Otherwise the screw may damage the inner part of the camera.

Maintenance Information

Keep the horizontal plane level

You can easily determine the horizontal plane by using the viewfinder frame as a reference.



Plan ahead

If you are going to edit the tape after recording, shoot the scene a little longer to make the editing easier.

Lighting

Shoot with the sun behind you.

When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.
- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

Use video light in the dark

To get the best colors, you must maintain a sufficient light level.

Photography lamps or halogen lamps are recommended. For best results, use of Sony video lights, since their weight and low heat output levels allow safe and direct connection to the camcorder.

Do not point the light at the camcorder. The high heat from the light may warp the casing of the camcorder.

For detailed instructions on proper use of the light, read its instruction manual.

Using Your Camcorder Abroad

Each country has its own electricity system and TV color system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Difference In Color System

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be an NTSC system based TV or a PAL-M system based TV with NTSC/PAL-M transcoder. Check the following list (in alphabetical order).

NTSC system countries

Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, The Philippines, U.S.A., Venezuela, etc.

PAL system countries

Australia, Austria, Belgium, China, Denmark, Finland, Germany (former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, Malaysia New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system country

Brazil

PAL N system countries

Argentina, Paraguay, Uruguay

SECAM system countries

Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, etc.

Precautions

On operation

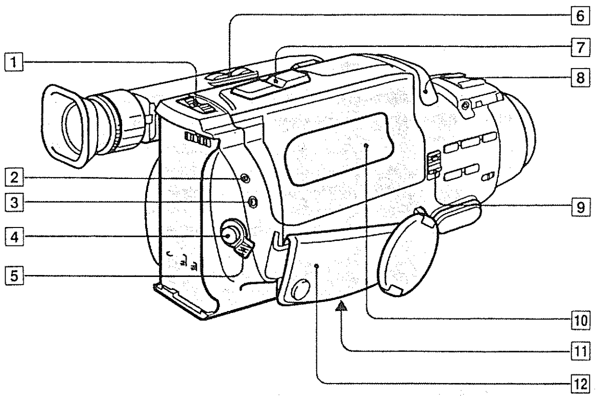
- Operate the camcorder on 6.0 V (battery pack) or 7.5 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder.**
  When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the camcorder to malfunction and sometimes the malfunction cannot be repaired.
- **Do not let the camcorder get wet.**
  Keep the camcorder from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.

On care

- When the unit will not be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth. Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Identifying the Parts

For details on the use of each part, refer to the pages indicated in the circle.



1 **POWER switch**
   CAMERA: for camera recording
   PLAYER: for playing back or editing tapes
   OFF: power off

2 **⟲ REMOTE control connector (stereo mini-minijack) ㉙**

3 **⑩ (earphone) jack (minijack)**

4 **START/STOP button**

5 **STANDBY switch**

6 **EDITSEARCH (and ⊜ recording review) button ㉖ ㉗ ㉘**

7 **Power zoom (MACRO) button ⑯**

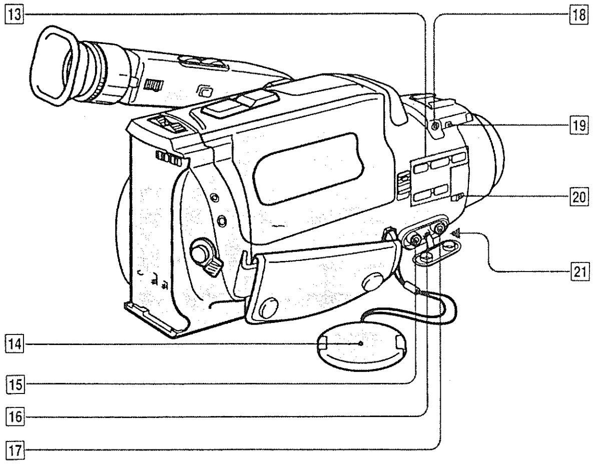
8 **Built-in microphone**

9 **EJECT (cassette eject) knob ⑧**

10 **Cassette holder**

11 **Lithium battery holder**

12 **Grip belt ⑭**



13 **Tape transport buttons ㉟**
   ▷ PLAY (playback)
   ▶▶ FF (fast-forward)
   ◀◀ REW (rewind)
   □ STOP (stop)
   ❚❚ PAUSE (pause)

14 **Lens cap**

15 **VIDEO output jack (phono jack) ㊲**

16 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)**

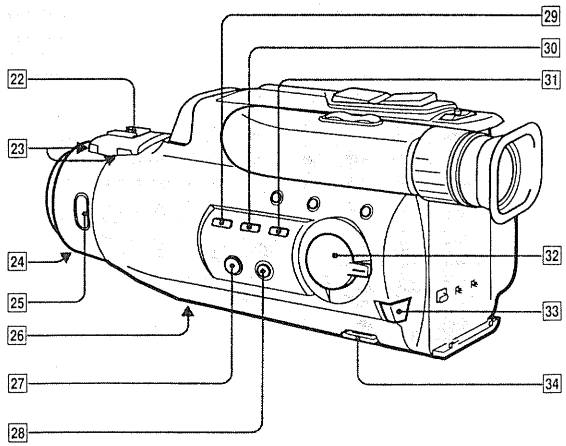
17 **AUDIO output jack (phono jack) ㊲**

18 **MIC jack (PLUG IN POWER) (mono mini-jack)**

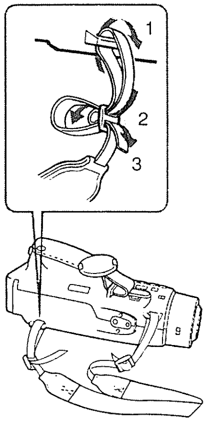
19 **Remote control sensor ⑲**

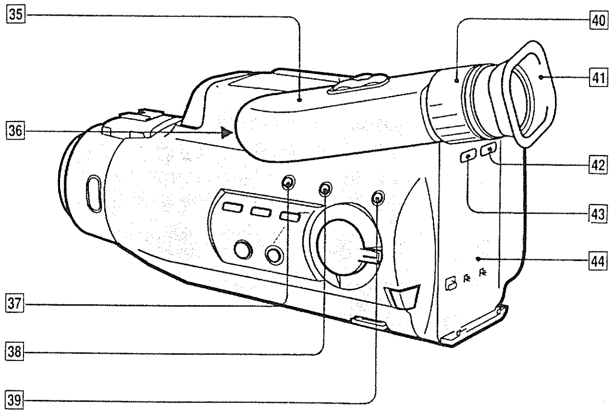
20 **EDIT switch ㊳**

21 **Hook for shoulder strap**



22 Accessory shoe
23 Remote control sensor ⑲
24 Focus HOLD switch ㉚
25 PUSH FOCUS HOLD button ㉚
26 Tripod receptacle (bottom)
27 FADER button ㉜
28 BACK LIGHT button ㉚
29 DATE (+) button ⑪ ⑫ ㉔
30 TIME (NEXT) button ⑪ ⑫ ㉔
31 AGE/EVENT button ⑫ ㉔
32 PROGRAM AE selector ⑭ ㉛
33 BATT (battery eject) knob ⑦
34 Hook for shoulder strap

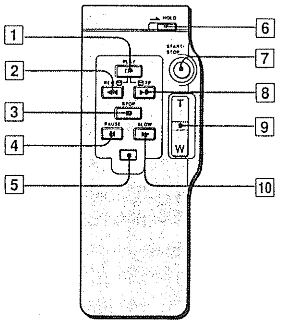




35 Viewfinder
36 Camera recording/battery lamp ㊿
37 COUNTER RESET button ㉘ ㊱
38 ZERO MEM button ㉘ ㊱
39 TAPE/BATT CHECK button ⑦ ⑮
40 Viewfinder adjustment ring ⑨
41 Eye cap
42 BEEP ON/OFF switch ⑤
43 ▣ REMOTE COMMANDER ON/OFF switch ⑲
44 Battery mounting surface

Identifying the Parts

Wireless Remote Commander


HOLD
START/STOP
PLAY
REW
FF
STOP
PAUSE
SLOW
T
W
1
2
3
4
5
6
7
8
9
10

1 ▷ PLAY (play back) button ㉟

2 ◀◀ REW (rewind) button ㉟

3 □ STOP button

4 ❚❚ PAUSE button ㉟

5 DATA SCREEN button* ㉟

6 HOLD switch* ⑲

7 START/STOP button

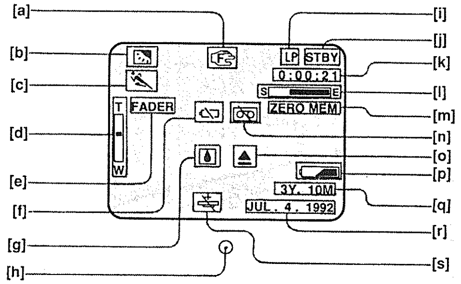
8 FF ▶▶ (fast forward) button ㉟

9 Power zoom button

10 ❚▶ SLOW (slow playback) button* ㉟

Note
The * indicates the functions which are operable only with the commander.

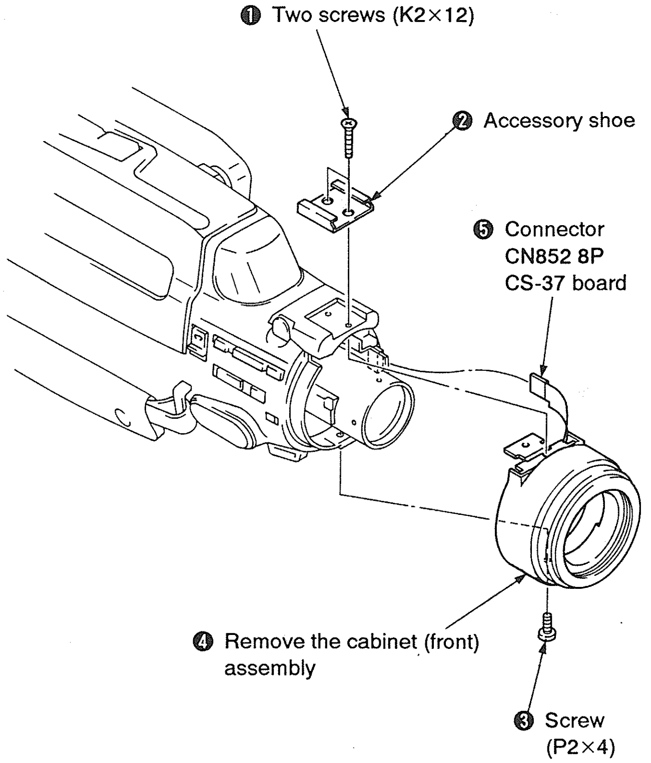
Inside the Viewfinder


[a]
[b]
[c]
[d]
[e]
[f]
[g]
[h]
[i]
[j]
[k]
[l]
[m]
[n]
[o]
[p]
[q]
[r]
[s]
T
W
FADER
LP
STBY
0:00:21
S
E
ZERO MEM
3Y. 10M
JUL. 4. 1992

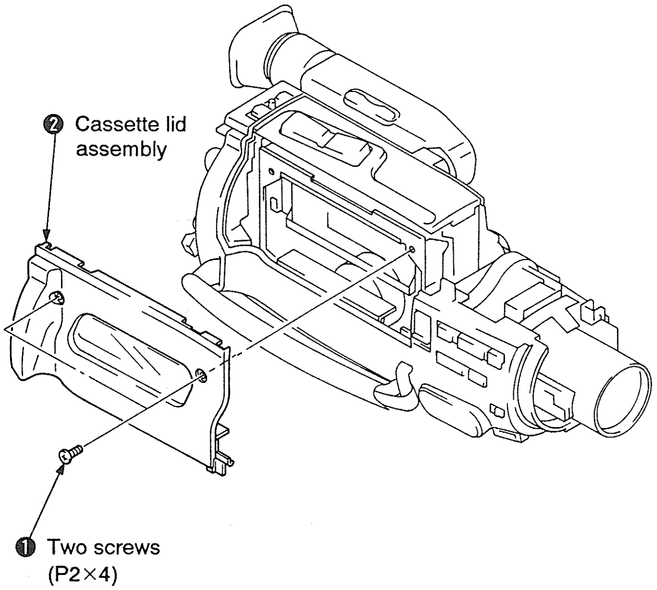
[a] Focus is maintained
[b] BACK LIGHT is pressed
[c] PROGRAM AE setting
[d] Power zoom indicator
[e] FADER is pressed
[f] "Exchange battery"
[g] Moisture has condensed
[h] Lights up during recording
When blinking: "Exchange battery or tape"
[i] Playback mode (LP)
[j] Tape transport mode
[k] Tape counter
[l] Remaining time of tape
[m] ZERO MEM is pressed
[n] "Exchange tape or no tape inside"
[0] "Trouble has occurred" (▲)
"Clean video heads" (⊗)
[p] Remaining capacity of a battery
[q] Age
[r] Date or Time
[s] "Replace lithium battery"

SECTION 2
DISASSEMBLY

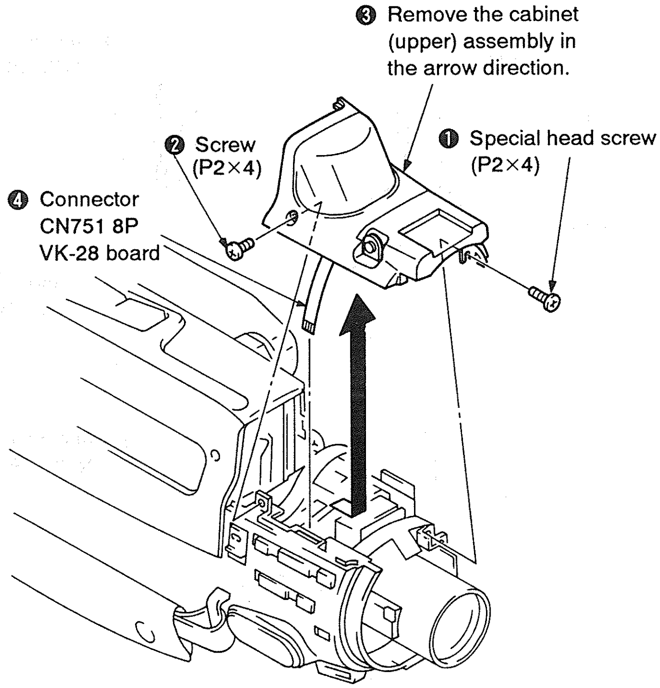
2-1. REMOVAL OF CABINET (FRONT) ASSEMBLY


① Two screws (K2×12)
② Accessory shoe
⑤ Connector
CN852 8P
CS-37 board
④ Remove the cabinet (front)
assembly
③ Screw
(P2×4)

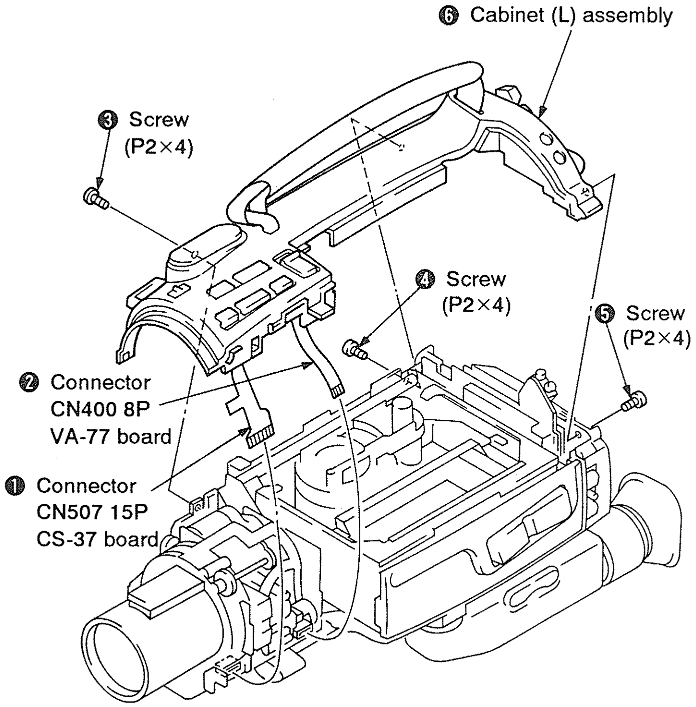
2-3. REMOVAL OF CASSETTE LID ASSEMBLY


② Cassette lid
assembly
① Two screws
(P2×4)

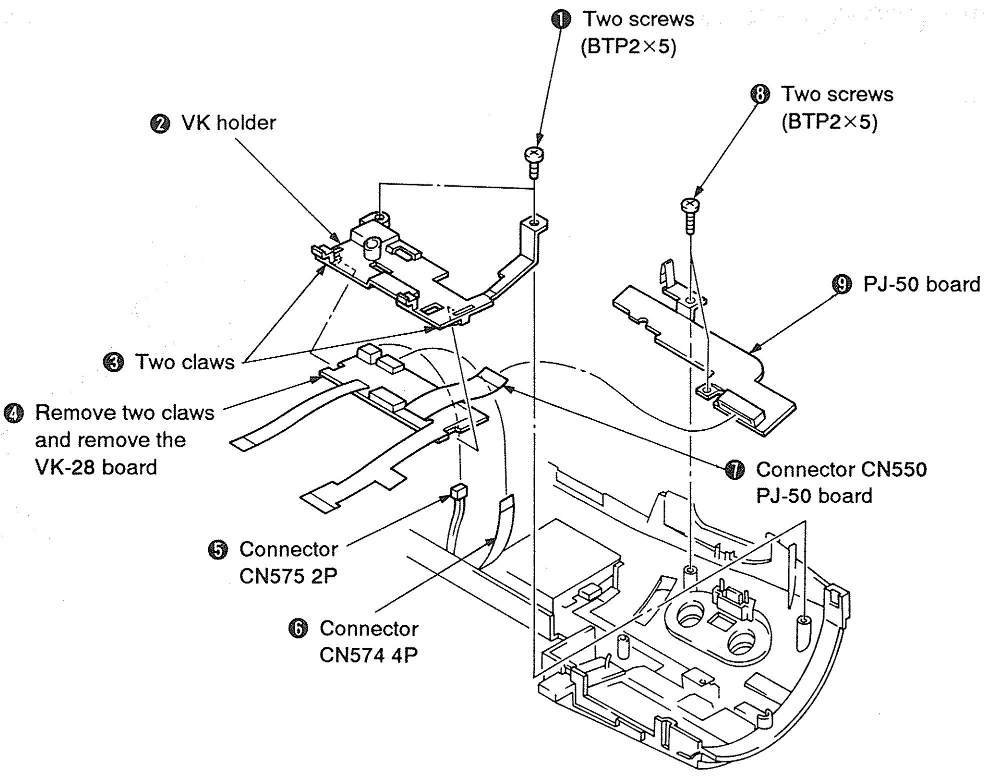
2-2. REMOVAL OF CABINET (UPPER) ASSEMBLY


③ Remove the cabinet
(upper) assembly in
the arrow direction.
② Screw
(P2×4)
① Special head screw
(P2×4)
④ Connector
CN751 8P
VK-28 board

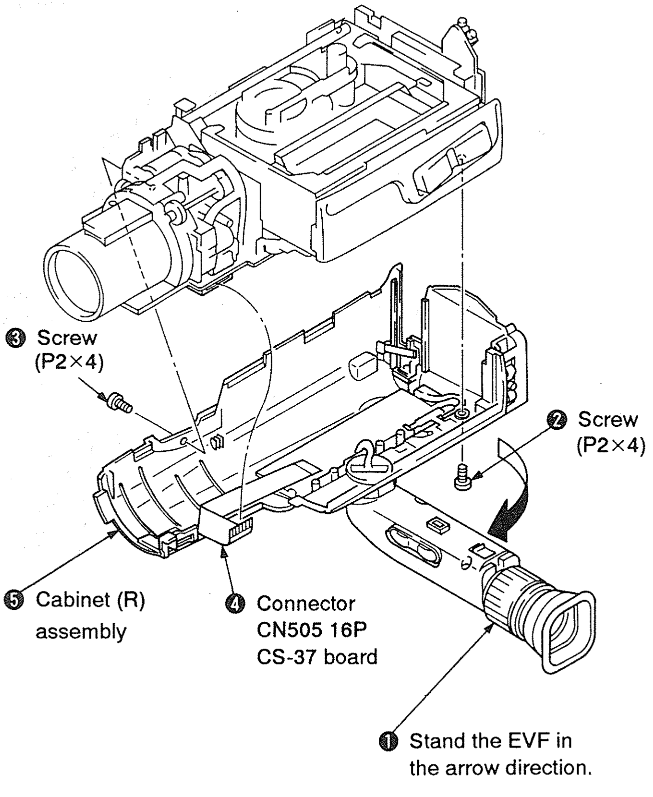
2-4. REMOVAL OF CABINET (L) ASSEMBLY


⑥ Cabinet (L) assembly
③ Screw
(P2×4)
④ Screw
(P2×4)
⑤ Screw
(P2×4)
② Connector
CN400 8P
VA-77 board
① Connector
CN507 15P
CS-37 board

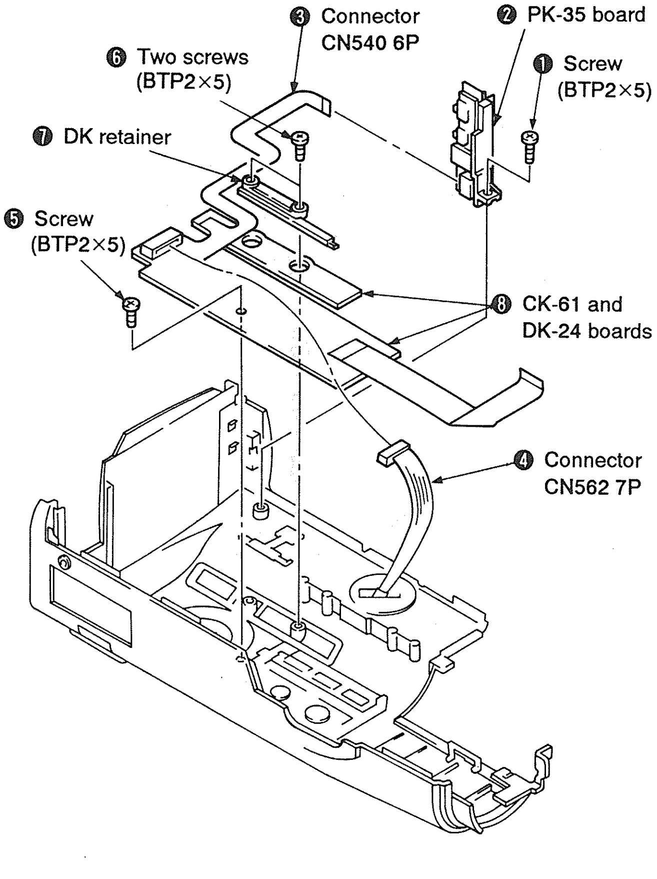
2-5. REMOVAL OF VK-28 AND PJ-50 BOARDS


① Two screws (BTP2×5)
② VK holder
⑧ Two screws (BTP2×5)
⑨ PJ-50 board
③ Two claws
④ Remove two claws and remove the VK-28 board
⑦ Connector CN550 PJ-50 board
⑤ Connector CN575 2P
⑥ Connector CN574 4P

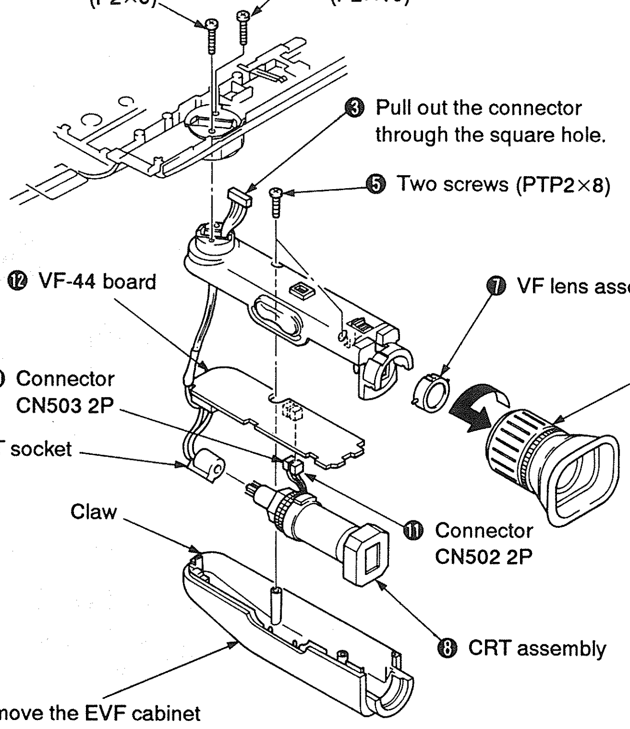
2-6. REMOVAL OF CABINET (R) ASSEMBLY


③ Screw (P2×4)
② Screw (P2×4)
⑤ Cabinet (R) assembly
④ Connector CN505 16P CS-37 board
① Stand the EVF in the arrow direction.

2-7. REMOVAL OF CK-61, DK-24 AND PK-35 BOARDS


③ Connector CN540 6P
② PK-35 board
⑥ Two screws (BTP2×5)
① Screw (BTP2×5)
⑦ DK retainer
⑤ Screw (BTP2×5)
⑧ CK-61 and DK-24 boards
④ Connector CN562 7P

2-8. REMOVAL OF EVF ASSEMBLY (VF-44 BOARD)



① Screw (P2×9)

② Screw (P2×10)

③ Pull out the connector through the square hole.

④ Remove the finder holder block assembly in the arrow direction. (Pull out to the position of the marking-off line and remove by turning in the arrow direction)

⑤ Two screws (PTP2×8)

⑥ Remove the EVF cabinet (R) by lifting up with the claw as it's fulcrum.

⑦ VF lens assembly

⑧ CRT assembly

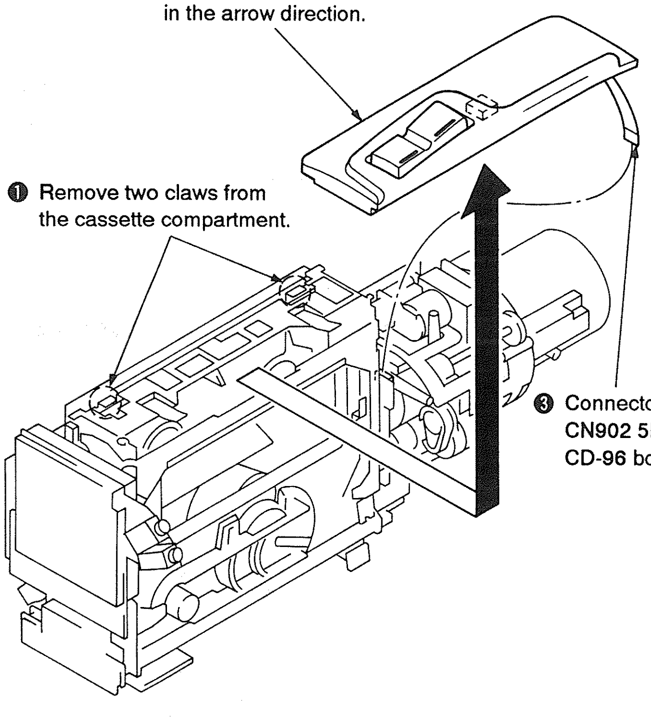
⑨ CRT socket

⑩ Connector CN503 2P

⑪ Connector CN502 2P

⑫ VF-44 board

2-9. REMOVAL OF LS LID ASSEMBLY

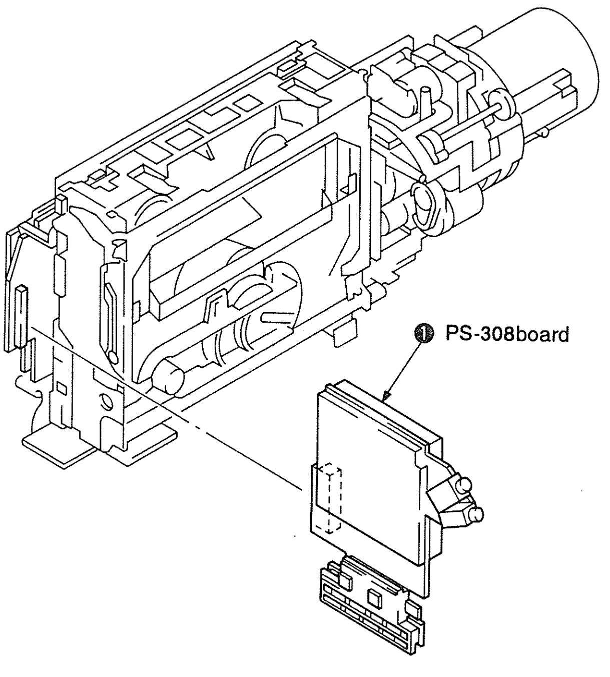


① Remove two claws from the cassette compartment.

② Remove the LS lid assembly in the arrow direction.

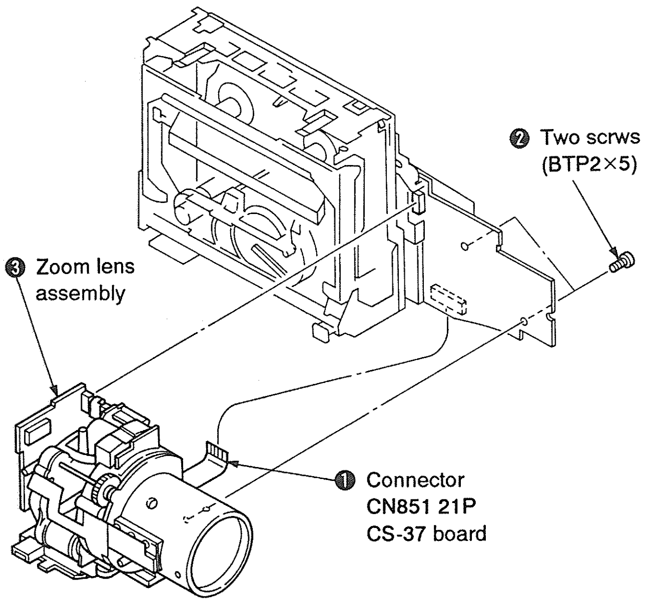
③ Connector CN902 5P CD-96 board

2-10. REMOVAL OF PS-308 BOARD

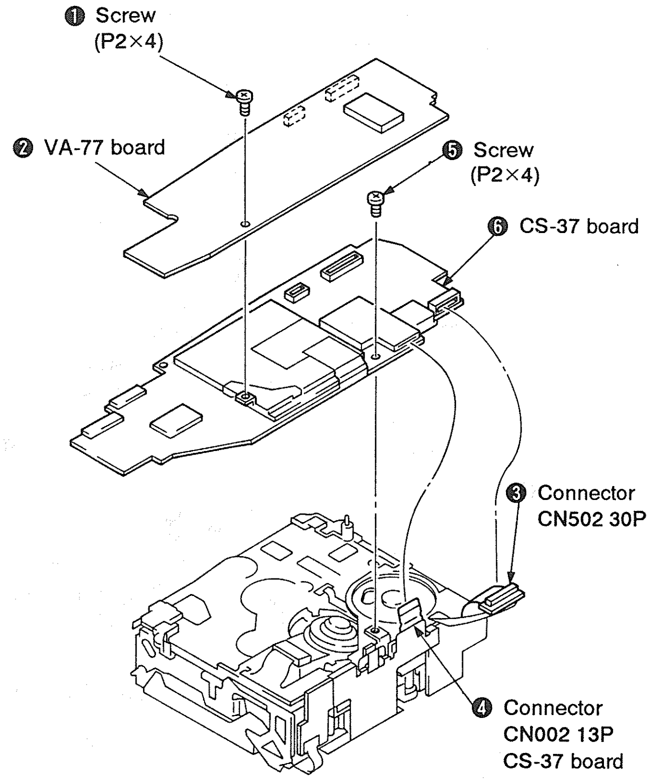


① PS-308board

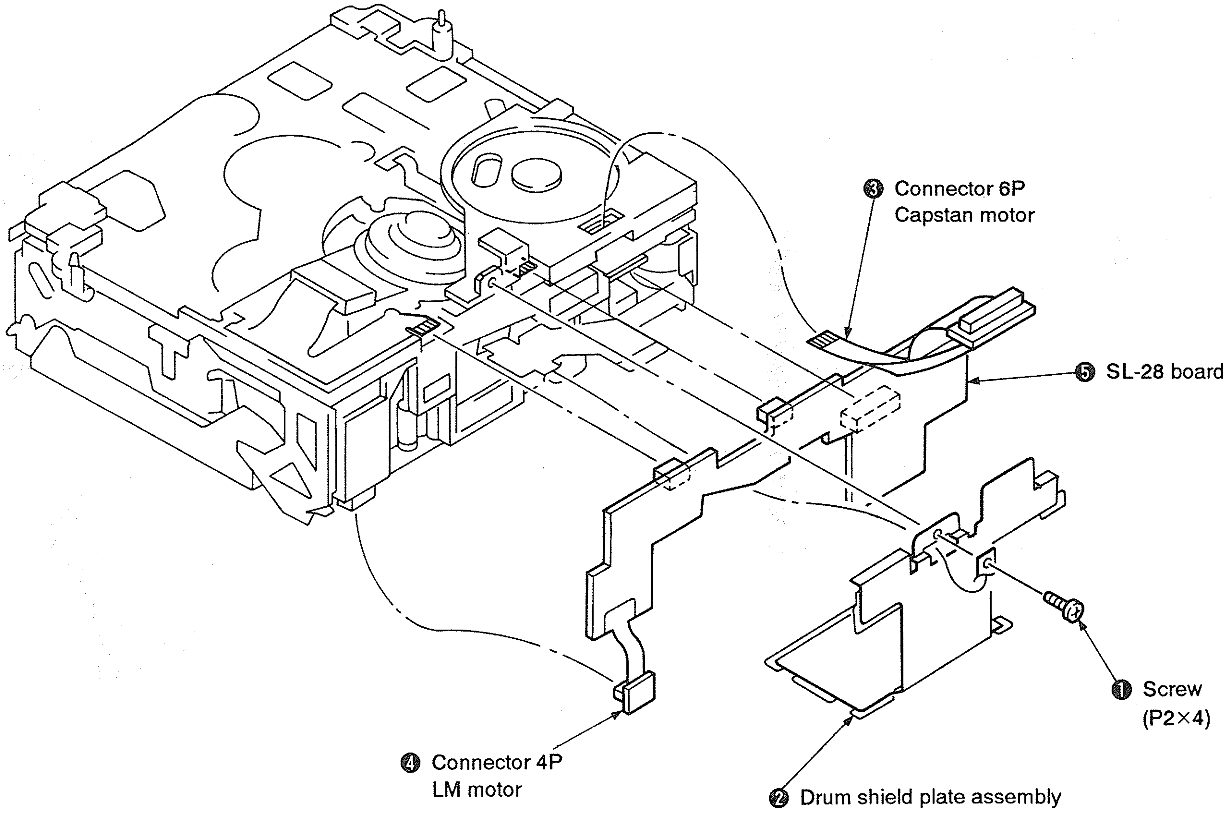
2-11. REMOVAL OF ZOOM LENS ASSEMBLY


❷ Two scrws
(BTP2×5)
❸ Zoom lens
assembly
❶ Connector
CN851 21P
CS-37 board

2-12. REMOVAL OF VA-77 AND CS-37 BOARDS

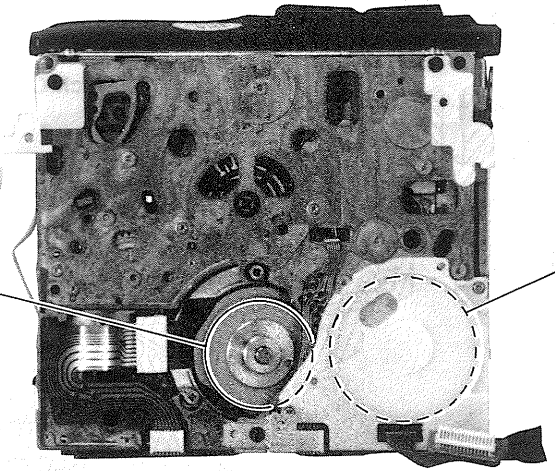

❶ Screw
(P2×4)
❷ VA-77 board
❺ Screw
(P2×4)
❻ CS-37 board
❸ Connector
CN502 30P
❹ Connector
CN002 13P
CS-37 board

2-13. REMOVAL OF SL-28 BOARD


❸ Connector 6P
Capstan motor
❺ SL-28 board
❶ Screw
(P2×4)
❹ Connector 4P
LM motor
❷ Drum shield plate assembly

2-14. INTERNAL VIEWS

— Right side —

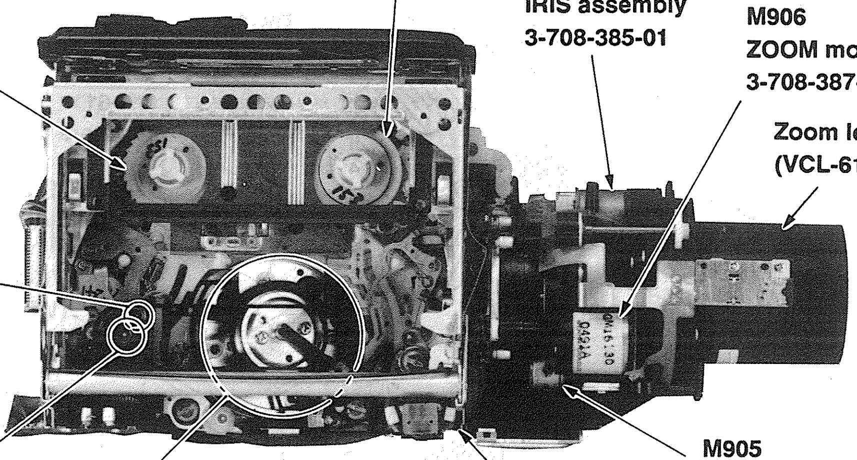


M901
Drum assembly
(DGH-0A2A-R)
A-7048-625-A

Upper drum assembly
(DGR-0A2-R)
A-7049-559-A

M902
Capstan motor
(SCE-0101A)
8-835-477-01

— Left side —



S reel table assembly
X-3941-275-1

T reel table assembly
X-3941-274-1

M904
IRIS assembly
3-708-385-01

M906
ZOOM motor assembly
3-708-387-01

Zoom lens assembly
(VCL-6110WB) 1-547-541-11

Pinch roller

M902
Capstan motor
(SCE-0101A)
8-835-477-01

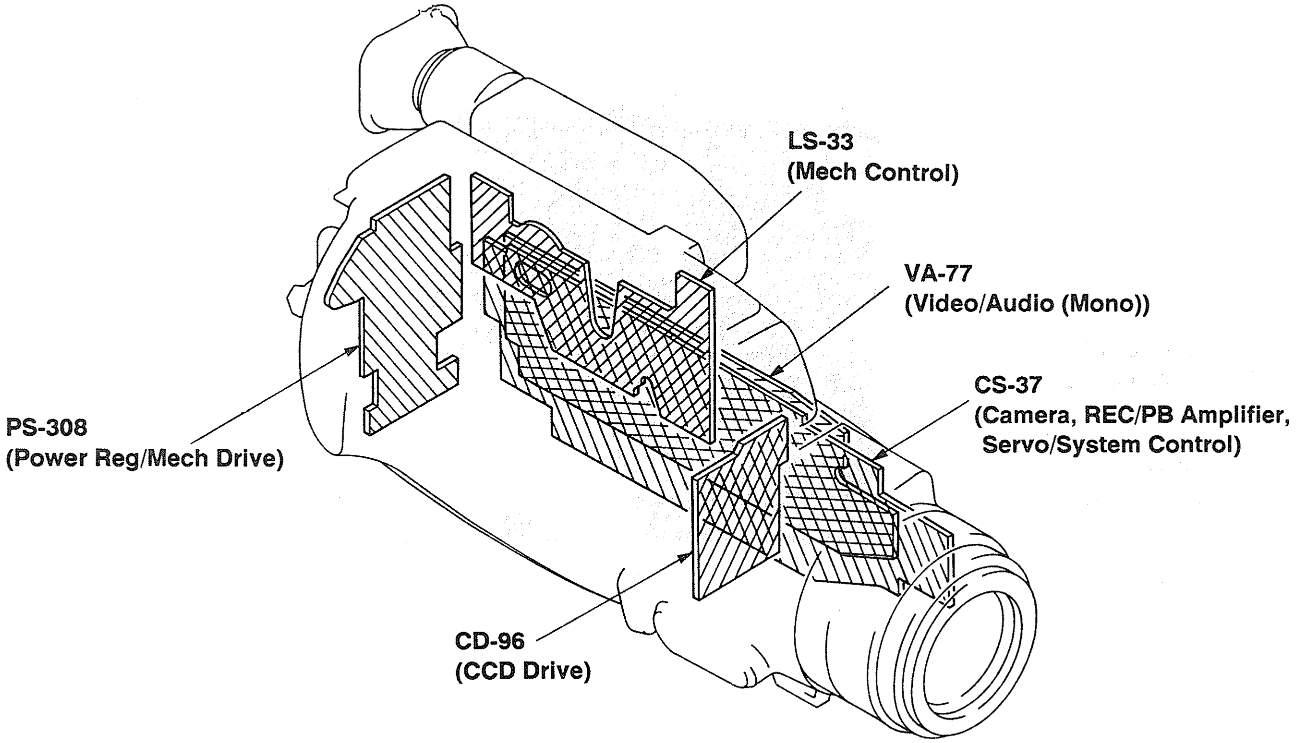
M901
Drum assembly (DGH-0A2A-R)
A-7048-625-A
Upper drum assembly (DGR-0A2-R)
A-7049-559-A

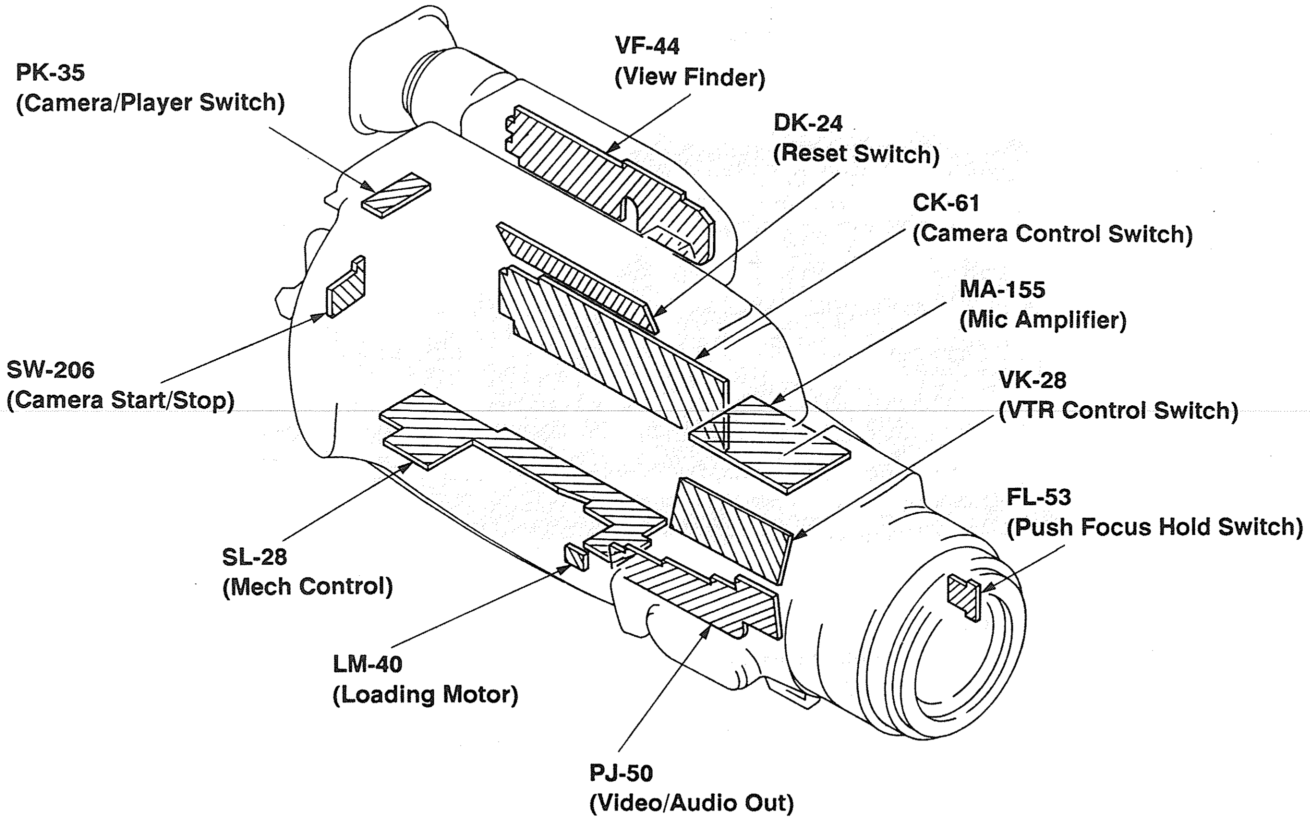
M905
FOCUS motor assembly
3-708-389-01

M903
Loading motor assembly
A-7040-304-A

SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION


LS-33
(Mech Control)
VA-77
(Video/Audio (Mono))
CS-37
(Camera, REC/PB Amplifier,
Servo/System Control)
PS-308
(Power Reg/Mech Drive)
CD-96
(CCD Drive)


PK-35
(Camera/Player Switch)
VF-44
(View Finder)
DK-24
(Reset Switch)
CK-61
(Camera Control Switch)
MA-155
(Mic Amplifier)
SW-206
(Camera Start/Stop)
VK-28
(VTR Control Switch)
FL-53
(Push Focus Hold Switch)
SL-28
(Mech Control)
LM-40
(Loading Motor)
PJ-50
(Video/Audio Out)

3-2. OVERALL BLOCK DIAGRAM

FL-53 BOARD
(See Page 133)
S400 KEY MATRIX (AUTO FOCUS SWITCH)
(See Page 86)
ZOOM SW
ZOOM SWITCH S1-4
CD-96 BOARD
(See Page 85)
IC901
CCD IMAGER
ZOOM LENS
M904 IRIS MOTOR
M905 (1/2) ZOOM MOTOR
ZOOM POSITION
HALL
M905 (1/2) FOCUS MOTOR
(See Page 93, 98, 101, 105, 107)
CS-37 BOARD
IC805
SIGNAL SEPARATION ADC
IC802
IC803
A/D CONV
IC707
CAMERA CORE (DIGITAL CAMERA PROCESS)
IC804
V DRIVE
IC801
TIMING GENERATOR
IC702
EVR
IC705
DPO
IC712
EEPROM
IC706
FOCUS PRE DRIVE
IC704
SYNC GENERATOR
IC703
ON SCREEN DISPLAY
IC851
IC852
IRIS DRIVE HALL AMP
IC854
ZOOM MOTOR DRIVE
IC709
CAMERA CONTROL
IC855
ZOOM POSITION AMP
IC853
FOCUS MOTOR DRIVE
DATA TO SLVE, DATA TO MAST, SCK
CAM Y
CAM C
(See Page 115, 120, 123)
VA-77 BOARD
PJ-50 BOARD (2/2)
(See Page 131)
J550
VIDEO
RFU DC OUT
AUDIO
IC201, IC202
IC205, IC206
IC051, IC054
Y PROCESS
IC301
C PROCESS
IC203, IC204
EVR
REC/PB AMP
IC101
FLYING ERASE OSC
CH1
CH2
FLYING ERASE
(See Page 131)
MA-155 BOARD
IC400
MIC AMP
MIC UNIT
IC401
AFM AUDIO PROCESS
IC401
REMOTE CONTROL RECIEVER
IC501
ATF SERVO PB SP/LP DET CLOG DET
(See Page 134)
FP-442 BOARD
M903 LOADING MOTOR
S001 MODE SWITCH
S005 CC DOWN
DEW SENSOR
S001 TAPE LED
Q001 TAPE TOP SENSOR
H001 T REEL FG SENSOR
H002 S REEL FG SENSOR
Q002 TAPE END SENSOR
S002 ME/MP REC PROOF
LS-33 BOARD
(See Page 134)
IC510
LOADING MOTOR DRIVE
TAPE TOP DETECT
T REEL FG AMP
S REEL FG AMP
TAPE END DETECT
(See Page 135)
IC501
WAVE SHAPER
SL-28 BOARD
IC503
MECHANISM CONTROL/SERVO
MECANISM CONTROL
SERVO
M901 DRUM MOTOR
DRUM PG, FG
IC505 (2/2)
DRUM MOTOR DRIVE
PS-308 BOARD (2/2)
(See Page 143)
DRUM PWM DRIVE
CAPSTAN PWM DRIVE
IC505 (1/2)
LPF
LPF
M902 CAPSTAN MOTOR
CAPSTAN FG
IC001
CAPSTAN MOTOR DRIVE
WAVE SHAPER
(See Page 134)
IC511
EEPROM
IC509
SIRCS CONTROL
IC506
MODE CONTROL (MASTER)
CHIP SELECT
IC507
BACK UP SWITCH
EVER 5V
IC502
LANC I/O
IC508
5V REG
CK-61 BOARD
(See Page 132)
S560, 564~568 KEY MATRIX (CAMERA FUNCTION SWITCH)
(See Page 133)
DK-24 BOARD
S561~563 KEY MATRIX (COUNTER FUNCTION SWITCH)
PK-35 BOARD
S540~541 KEY MATRIX (POWER, REMOTE) BUZZER SWITCH
(See Page 133)
VF-44 BOARD
(See Page 141)
S501, 502 KEY MATRIX (EDIT SEARCH) SWITCH
CRT DRIVE
IC501
CRT
VK-28 BOARD
(See Page 132)
S570~576 KEY MATRIX (VTR FUNCTION SWITCH)
(See Page 133)
SW-206 BOARD
S580, 581 KEY MATRIX (START/STOP, STANDBY SWITCH)
PJ-50 BOARD (1/2)
(See Page 131)
S550 KEY MATRIX (EDIT SWITCH)
S551 (1/2) AUDIO VIDEO (IN/OUT SWITCH)
BU550 BUZZER
LITHIUM BATTERY
PS-308 BOARD (1/2)
(See Page 143)
IC950
CAMERA DC/DC CONVERTER
VTR DC/DC CONVERTER
J950 BATTERY TERMINAL
J951 REMOTE
J952 EARPHONE

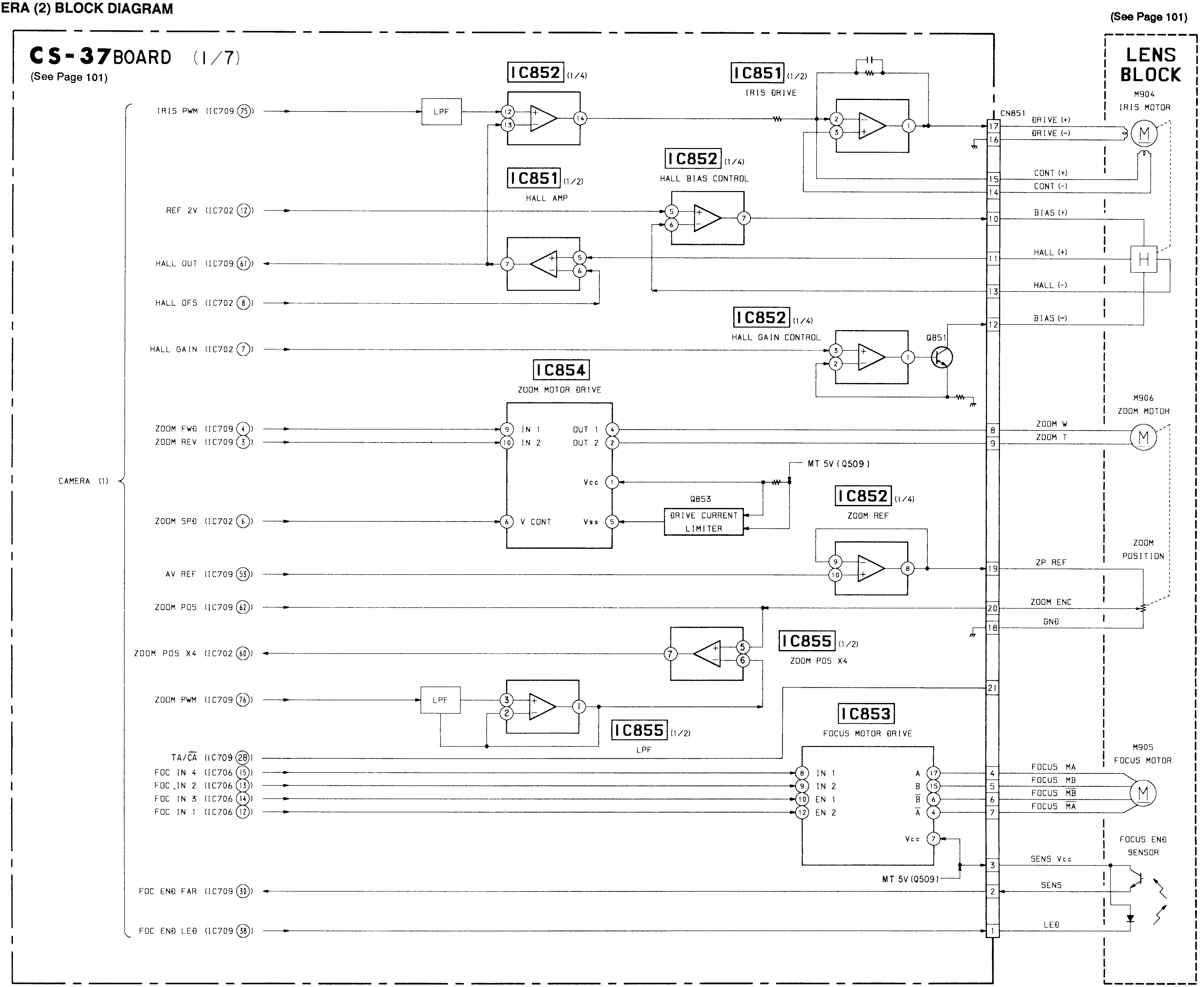
3-3. CAMERA (1) BLOCK DIAGRAM

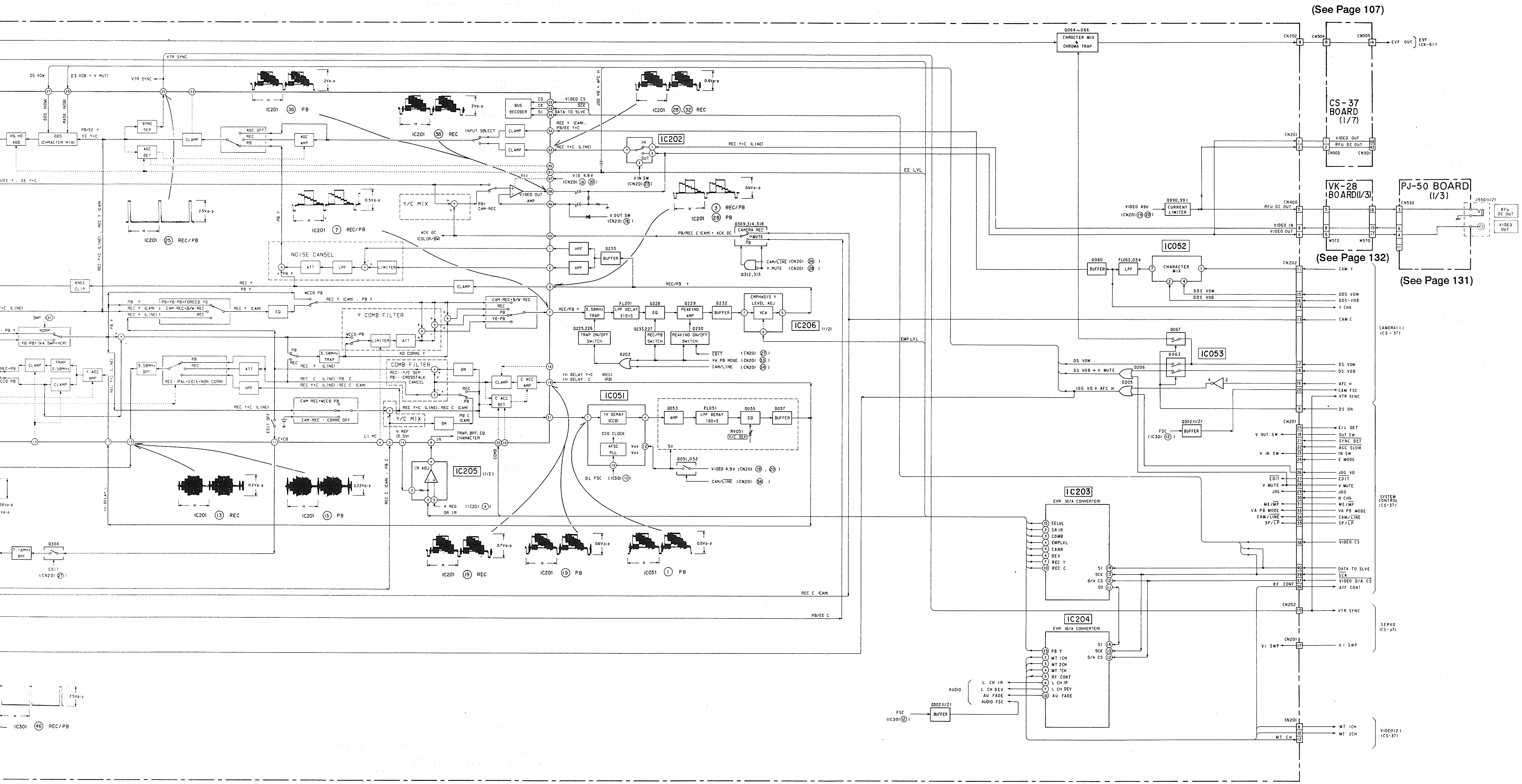
CD-96 BOARD
(See Page 85)
IC901
ZOOM SW
(See Page 86)
CS-37 BOARD (1/7)
(See Page 93, 98)
IC805
IC804
IC801
IC803
IC802
IC707
IC704
IC701
IC702
IC706
IC709
IC712
IC705
IC703
(See Page 133)
FL-53 BOARD

3-4. CAMERA MICROPROCESSOR PIN FUNCTION (IC709 ON CS-37 BOARD: CXP80624-299Q)

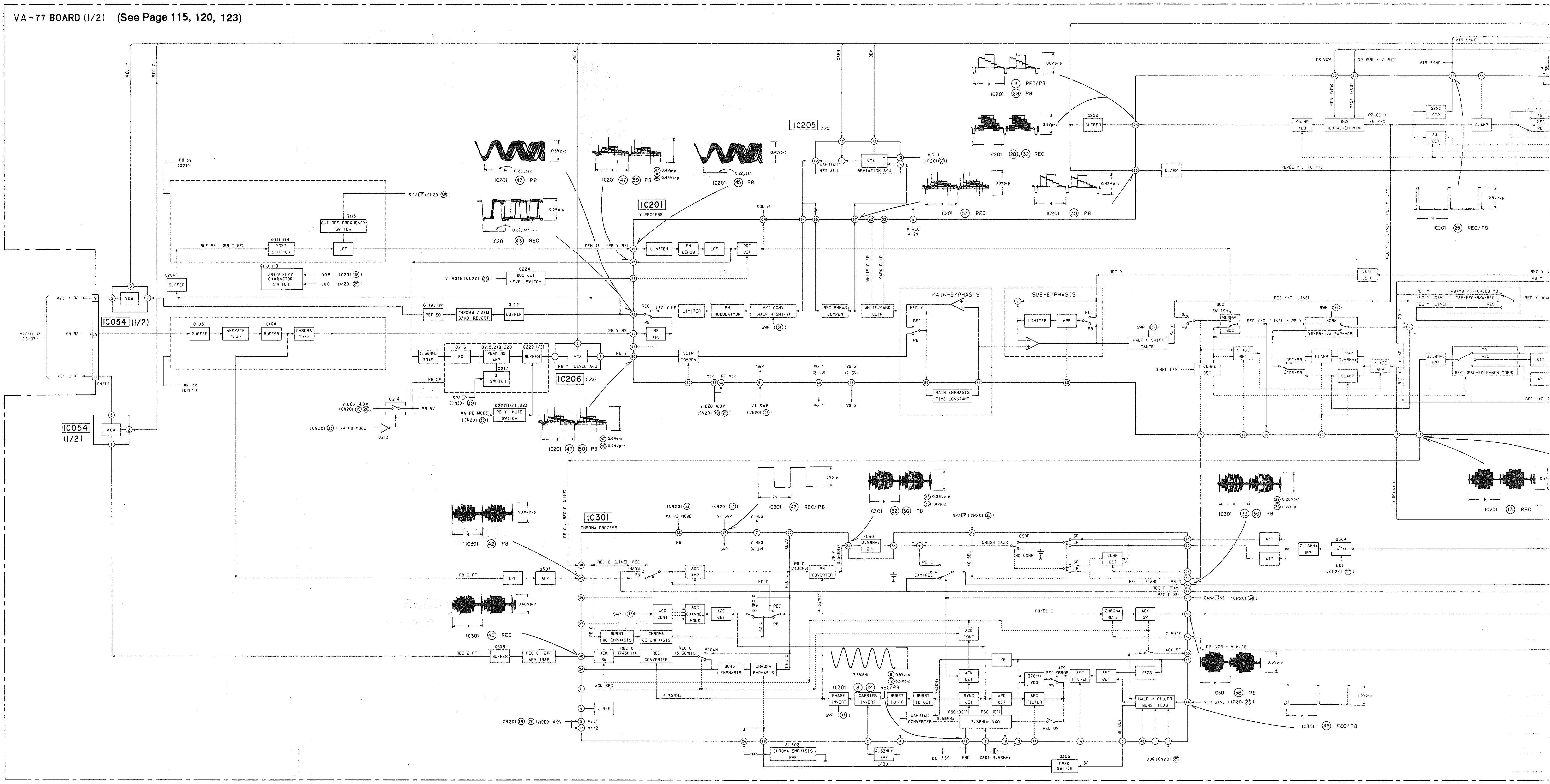
Pin No.	Signal	I/O	Function
1	EPROM DI	O	Not used.
2	EPROM SCK	O	
3	ZOOM M REV	O	Zoom motor control signal. Normally "H". 16.6 msec period PWM signal when rotating to WIDE.
4	ZOOM M FWD	O	Zoom motor control signal. Normally "H". 16.6 msec period PWM signal when rotating to TELE.
5	PB1		Not used.
6	PB0		
7	RT07/D7		
8	RT06/D6		
9	RT05/D5		
10	CORE RESET	O	Camera core (IC707 on CS-37 board) reset signal. Normally "H". "L" when reset.
11	PDR RESET	O	Focus predriver (IC706 on CS-37 board) reset signal. Normally "H". "L" when reset.
12	TG STBY1		Not used.
13	TG STBY2		
14	OPD RESET	O	OPD (IC705 on CS-37 board) reset signal. "H": camera mode. "L": VTR mode.
15	PJ7/FSEL31		Not used.
16	PJ6/FSEL30		
17	PJ5/FSEL21		
18	PJ4/FSEL20		
19	PJ3/FSEL11		
20	PJ2/FSEL10		
21	PJ1/FSEL01		
22	PJ0/FSEL00		
23	EPROM DO	O	
24	EPROM BUSY	I	BUSY signal from EEPROM. Normally "H". "L" pulse when data reading/writing.
25	FOC NEAR		Not used.
26	FOC FAR		
27	PD3/C	I	Fixed to +5V.
28	TA/$\overline{\text{CA}}$	I	
29	WIDE END		Fixed to +5V.
30	FOC END FAR	I	Focus end FAR sensor input. Normally "L".
31	$\overline{\text{CAM ON}}$	O	Power supply control signal. Normally "L".
32	PH6		Not used.
33	PH5		
34	PH4		
35	PH3		
36	PH2		
37	PH1		
38	FOC END LED	O	Focus end sensor LED control signal. Normally "H" (4.4V).
39	MP		Connected to GND.
40	$\overline{\text{CAM RESET}}$	I	Reset signal input. Normally "H". "L" when reset.
41	VSS		GND
42	XTAL	O	12 MHz clock oscillation circuit
43	EXTAL	I	
44	CS CAM	I	Chip select signal from mode control microprocessor.
45	VTR SO	I	Serial data input from mode control microprocessor.
46	VTR SI	O	Serial data output from mode control microprocessor.
47	VTR SCK	I	Serial data transfer clock
48	PF7/AN11		Not used.
49	PF6/AN10		
50	PF5/AN9		
51	PF4		Not used.
52	AVSS		GND
53	AVREF		Analog input port reference voltage (5V)
54	AVDD		Analog input port voltage (5V)
55	PF3/AN7		Connected to GND.
56	PF2/AN6		
57	MAN FOCUS (2)	I	Manual focus input. 0 to 5 Vdc.
58	MAN FOCUS (1)	I	Manual focus input. 0 to 5 Vdc.
59	ZOOM SW	I	Zoom key input. 4.3V: F. TELE, 3.1V: TELE, 0.7V: F. WIDE, 1.9V: WIDE, 2.5V: no input.
60	ZOOM POS X4	I	Zoom position voltage. approx. 0V (WIDE end) to approx. 3V (TELE end).
61	HALL A/D	I	Hall voltage. approx. 1V (iris open) to approx. 3V (iris close).
62	ZOOM POSITION A/D	I	Zoom position voltage. approx. 0.2V (WIDE end) to approx. 2.4V (TELE end).
63	PG7/EX11		Connected to 5V.
64	PG6/EX10		
65	PG5/SYNC1		
66	VTR SYNC		
67	PB CTL		
68	DPG		
69	FOC FG		
70	AF BUSY	I	AF busy signal
71	PE7/DAB1		Not used.
72	PE6/DAB0		
73	PE5/DAA1		
74	PE4/DAA0		
75	IRIS PWM	O	Iris control signal. 25.5 μsec period PWM signal
76	ZP PWM	O	Zoom position detection voltage output. 25.5 μsec period PWM signal
77	AJST	I	Adjustment timing pulse input. Normally "H".
78	VD	I	VD signal input from sync generator
79	CAM SI	I	Serial data input
80	CAM SO	O	Serial data output
81	CAM SCK	O	Serial data transfer clock
82	CS CAM		Not used.
83	PI/TO		
84	PI/PWM		
85	PI/PO		
86	PI O		Connected to +5V.
87	PKO		
88	GND		GND
89	VDD		+5V power supply
90	VPP		
91	PA7/A15		Not used.
92	$\overline{\text{CS PDR}}$	O	Chip select signal to focus predriver (IC706 on CS-37 board)
93	$\overline{\text{CS CAM D/A}}$	O	Chip select signal to camera EVR (IC702 on CS-37 board)
94	$\overline{\text{CS ROM}}$	O	Chip select signal to EEPROM (IC712 on CS-37 board)
95	$\overline{\text{CS OPD}}$	O	Chip select signal to OPD (IC705 on CS-37 board)
96	$\overline{\text{NTSC}}$	O	NTSC: "L", PAL: "H"
97	$\overline{\text{CS CORE}}$	O	Chip select signal to camera core (IC707 on CS-37 board)
98	$\overline{\text{CS TG}}$	O	Select signal to timing generator (IC801 on CS-37 board)
99	J STB		Not used.
100	PB6		

3-5. CAMERA (2) BLOCK DIAGRAM

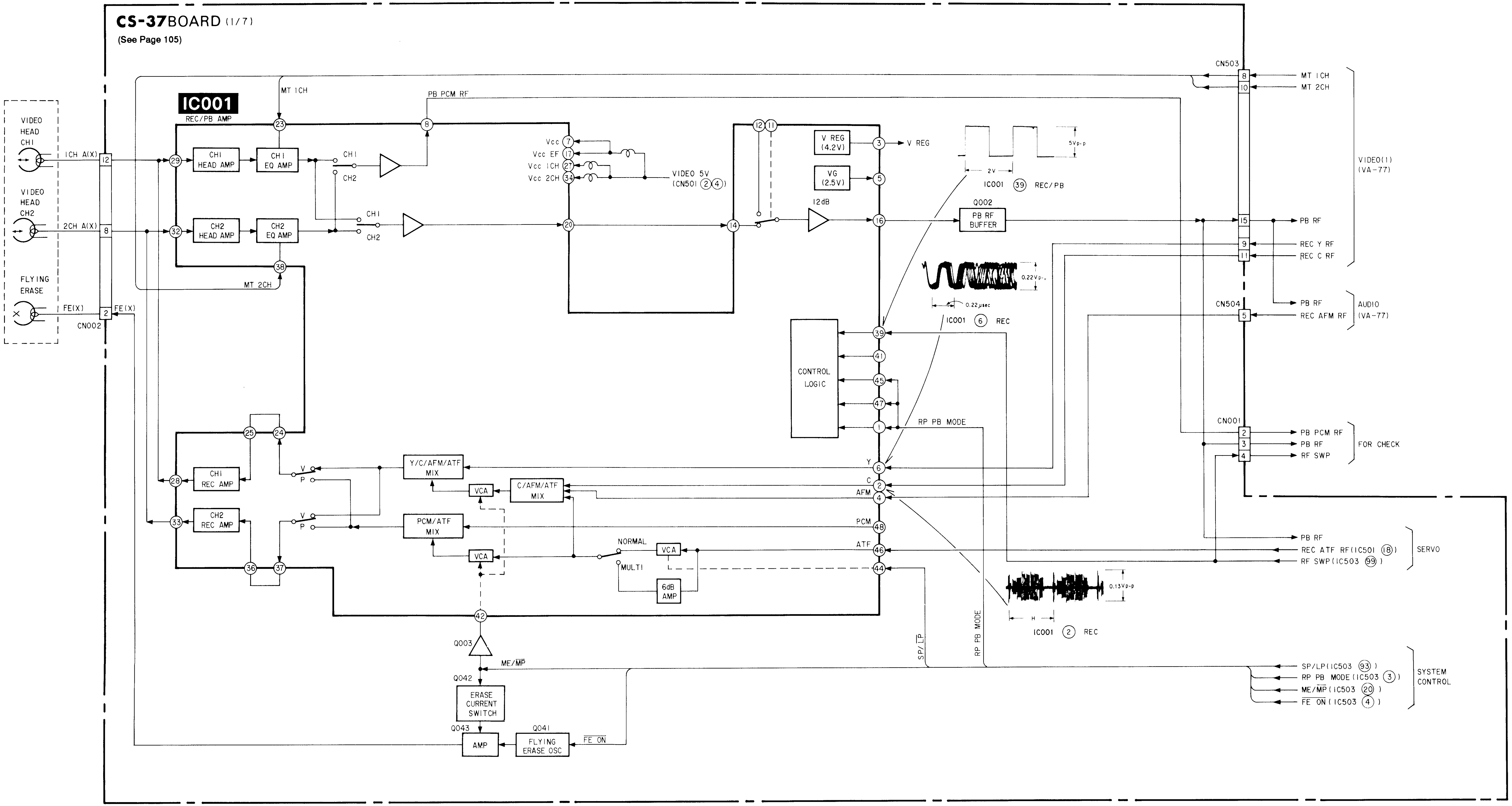

CS-37BOARD (1/7)
(See Page 101)
(See Page 101)
LENS BLOCK
CAMERA (1)
IRIS PWM (IC709 ⑦⑤)
REF 2V (IC702 ⑫)
HALL OUT (IC709 ⑥①)
HALL OFS (IC702 ⑧)
HALL GAIN (IC702 ⑦)
ZOOM FWD (IC709 ④)
ZOOM REV (IC709 ③)
ZOOM SPD (IC702 ⑥)
AV REF (IC709 ⑤③)
ZOOM POS (IC709 ⑥②)
ZOOM POS X4 (IC702 ⑥⓪)
ZOOM PWM (IC709 ⑦⑥)
TA/CA (IC709 ㉘)
FOC IN 4 (IC706 ⑮)
FOC IN 2 (IC706 ⑬)
FOC IN 3 (IC706 ⑭)
FOC IN 1 (IC706 ⑫)
FOC END FAR (IC709 ㉚)
FOC END LED (IC709 ㊳)
LPF
IC852 (1/4)
IC851 (1/2)
HALL AMP
IC851 (1/2)
IRIS DRIVE
IC852 (1/4)
HALL BIAS CONTROL
IC852 (1/4)
HALL GAIN CONTROL
Q851
IC854
ZOOM MOTOR DRIVE
IN 1
IN 2
OUT 1
OUT 2
Vcc
Vss
V CONT
Q853
DRIVE CURRENT LIMITER
MT 5V (Q509)
IC852 (1/4)
ZOOM REF
IC855 (1/2)
ZOOM POS X4
IC855 (1/2)
LPF
IC853
FOCUS MOTOR DRIVE
IN 1
IN 2
EN 1
EN 2
A
B
B
A
Vcc
MT 5V (Q509)
CN851
DRIVE (+)
DRIVE (–)
CONT (+)
CONT (–)
BIAS (+)
HALL (+)
HALL (–)
BIAS (–)
ZOOM W
ZOOM T
ZP REF
ZOOM ENC
GND
FOCUS MA
FOCUS MB
FOCUS MB
FOCUS MA
SENS Vcc
SENS
LED
M904
IRIS MOTOR
M906
ZOOM MOTOR
ZOOM POSITION
M905
FOCUS MOTOR
FOCUS END SENSOR


(See Page 107)
CS-37 BOARD (1/7)
VK-28 BOARD(1/3)
PJ-50 BOARD (1/3)
(See Page 132)
(See Page 131)
IC202
IC206
IC051
IC052
IC053
IC203
IC204
IC205
VTR SYNC
DS VOW
DS VOB + V MUTE
VG HD ADD
CHARACTER MIX
SYNC SEP
CLAMP
AGC AMP
AGC DET
BUS DECODER
INPUT SELECT
Y/C MIX
VIDEO OUT AMP
NOISE CANSEL
ATT
LPF
LIMITER
HPF
BUFFER
KNEE CLIP
Y COMB FILTER
COMB FILTER
3.58MHz TRAP
LPF DELAY
EQ
PEAKING AMP
EMPHASIS Y LEVEL ADJ
VCA
TRAP ON/OFF SWITCH
REC/PB SWITCH
PEAKING ON/OFF SWITCH
1H DELAY
CCD CLOCK
4FSC PLL
AMP
C ACC AMP
C ACC DET
DM
IR ADJ
CHARACTER MIX & CHROMA TRAP
CURRENT LIMITER
EVR (D/A CONVERTER)
EVF OUT
RFU DC OUT
VIDEO OUT
CAMERA(1) (CS-37)
SYSTEM CONTROL (CS-37)
SERVO (CS-37)
VIDEO(2) (CS-37)
IC201 (38) PB
IC201 (38) REC
IC201 (28),(32) REC
IC201 (25) REC/PB
IC201 (7) REC/PB
IC201 (3) REC/PB
IC201 (28) PB
IC201 (13) REC
IC201 (13) PB
IC201 (19) REC
IC201 (19) PB
IC051 (1) PB
IC301 (46) REC/PB
7.16MHz BPF
AUDIO

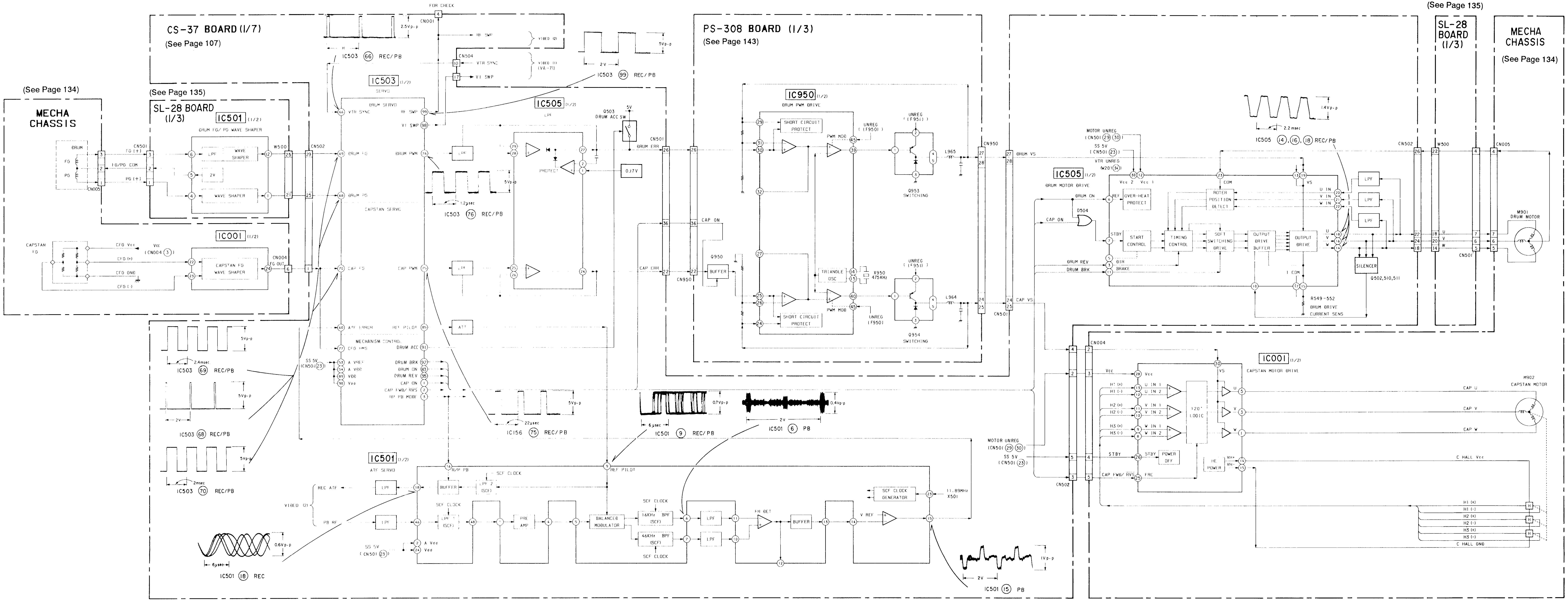
3-6. VIDEO (1) BLOCK DIAGRAM


VA-77 BOARD (1/2) (See Page 115, 120, 123)
IC054 (1/2)
VCA
IC201
Y PROCESS
LIMITER
FM DEMOD
LPF
DOC DET
FM MODULATOR
V/I CONV (HALF H SHIFT)
RF AGC
CLIP COMPEN
IC205 (1/2)
CARRIER SET ADJ
DEVIATION ADJ
IC206 (1/2)
PB Y LEVEL ADJ
Q115 CUT-OFF FREQUENCY SWITCH
Q111,114 SOFT LIMITER
Q110,118 FREQUENCY CHARACTOR SWITCH
Q204 BUFFER
Q103 BUFFER
AFM/ATF TRAP
Q104 BUFFER
CHROMA TRAP
Q224 DOC DET LEVEL SWITCH
Q119,120 REC EQ
CHROMA / AFM BAND REJECT
Q122 BUFFER
3.58MHz TRAP
Q216 EQ
Q215,218,220 PEAKING AMP
Q222(1/2) BUFFER
Q217 Q SWITCH
Q221(1/2),223 PB Y MUTE SWITCH
Q214
Q213
REC SHEAR COMPEN
WHITE/DARK CLIP
MAIN-EMPHASIS
MAIN EMPHASIS TIME CONSTANT
SUB-EMPHASIS
LIMITER
HPF
HALF H SHIFT CANCEL
Q202 BUFFER
CLAMP
VG HD ADD
DDS (CHARACTER MIX)
SYNC SEP
AGC DET
KNEE CLIP
Y CORRE DET
Y AGC DET
TRAP 3.58MHz
Y AGC AMP
3.58MHz BPF
IC301
CHROMA PROCESS
LPF
Q307 AMP
Q308 BUFFER
REC C BPF AFM TRAP
ACC AMP
ACC CONT
ACC CHANNEL HOLD
ACC DET
BURST DE-EMPHASIS
CHROMA DE-EMPHASIS
ACK SW
REC CONVERTER
BURST EMPHASIS
CHROMA EMPHASIS
PB CONVERTER
FL301 3.58MHz BPF
CORR DET
ATT
7.16MHz BPF
Q304
CHROMA MUTE
ACK SW
ACK CONT
1/8
ACK DET
PHASE INVERT
CARRIER INVERT
BURST 1/0 FF
BURST 1/0 DET
SYNC DET
APC DET
378fH VCO
APC FILTER
AFC FILTER
AFC DET
1/378
HALF H KILLER BURST FLAG
CARRIER CONVERTER
3.58MHz VXO
I REF
FL302 CHROMA EMPHASIS BPF
4.32MHz BPF CF301
Q306 FREQ SWITCH
X301 3.58MHz
IC201 (43) PB
IC201 (43) REC
IC201 (47) (50) PB
IC201 (45) PB
IC201 (3) REC/PB
IC201 (28) PB
IC201 (28),(32) REC
IC201 (57) REC
IC201 (30) PB
IC201 (25) REC/PB
IC201 (13) REC
IC301 (42) PB
IC301 (40) REC
IC301 (47) REC/PB
IC301 (32),(36) PB
IC301 (8),(12) REC/PB
IC301 (38) PB
IC301 (46) REC/PB
VIDEO 4.9V (CN201 (19)(20))
VA PB MODE (CN201 (33))
SP/LP (CN201 (35))
JOG (CN201 (29))
CAM/CINE (CN201 (34))
VTR SYNC (IC201 (25))
V MUTE (CN201 (28))
EDIT (CN201 (7))

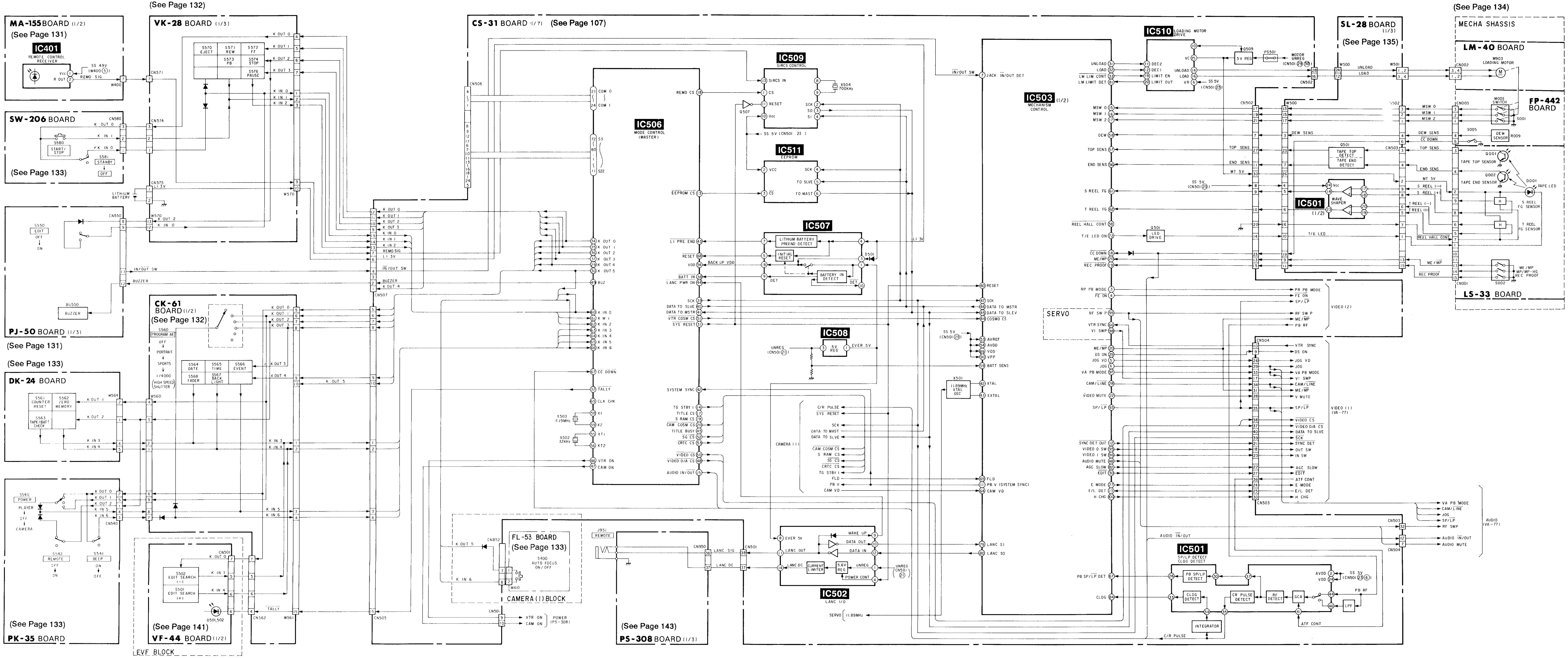
3-7. VIDEO (2) BLOCK DIAGRAM


CS-37BOARD (1/7)
(See Page 105)
IC001
REC/PB AMP
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
1CH A(X)
2CH A(X)
FE(X)
CN002
MT 1CH
MT 2CH
PB PCM RF
CH1 HEAD AMP
CH1 EQ AMP
CH2 HEAD AMP
CH2 EQ AMP
CH1
CH2
Vcc
Vcc EF
Vcc 1CH
Vcc 2CH
VIDEO 5V (CN501 ② ④)
V REG (4.2V)
VG (2.5V)
V REG
12dB
5Vp-p
2V
IC001 ㊴ REC/PB
Q002
PB RF BUFFER
0.22Vp-p
0.22μsec
IC001 ⑥ REC
CONTROL LOGIC
RP PB MODE
CH1 REC AMP
CH2 REC AMP
V
P
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
VCA
PCM/ATF MIX
NORMAL
MULTI
6dB AMP
Y
C
AFM
PCM
ATF
0.13Vp-p
H
IC001 ② REC
SP/LP
RP PB MODE
Q003
ME/MP
Q042
ERASE CURRENT SWITCH
Q043
AMP
Q041
FLYING ERASE OSC
FE ON
CN503
MT 1CH
MT 2CH
PB RF
REC Y RF
REC C RF
VIDEO(1) (VA-77)
CN504
PB RF
REC AFM RF
AUDIO (VA-77)
CN001
PB PCM RF
PB RF
RF SWP
FOR CHECK
PB RF
REC ATF RF(IC501 ⑱)
RF SWP(IC503 ㊾)
SERVO
SP/LP(IC503 (93))
RP PB MODE(IC503 ③)
ME/MP(IC503 ⑳)
FE ON(IC503 ④)
SYSTEM CONTROL

3-8. SERVO BLOCK DIAGRAM


(See Page 134)
MECHA CHASSIS
(See Page 135)
SL-28 BOARD (1/3)
IC501 (1/2)
DRUM FG/PG WAVE SHAPER
WAVE SHAPER
LPF
IC001 (1/2)
CAPSTAN FG WAVE SHAPER
CAPSTAN FG
CFG Vcc
CFG (+)
CFG GND
CFG (-)
CN501
CN005
W500
CN004
CN502
CS-37 BOARD (1/7)
(See Page 107)
FOR CHECK
CN001
CN504
IC503 (66) REC/PB
IC503 (1/2)
SERVO
DRUM SERVO
VTR SYNC
HI SWP
V1 SWP
DRUM FG
DRUM PG
DRUM PWM
CAPSTAN SERVO
CAP FG
CAP PWM
ATF LINNER
REF PILOT
MECHANISM CONTROL
CFG RMS
DRUM ACC
SS 5V (CN501 (23))
A VREF
A Vcc
VDD
Vss
DRUM BRK
DRUM ON
DRUM REV
CAP ON
CAP FWD/RVS
RP PB MODE
VIDEO (2)
VIDEO (1) (VA-71)
IC503 (99) REC/PB
IC503 (76) REC/PB
IC503 (69) REC/PB
IC503 (68) REC/PB
IC503 (70) REC/PB
IC156 (75) REC/PB
IC505 (1/2)
LPF
PROTECT
Q503 DRUM ACC SW
0.17V
LPF
ATT
IC501 (1/2)
ATF SERVO
REC ATF
PB RF
LPF
BUFFER
LPF (SCF)
SCF CLOCK
PRE AMP
BALANCED MODULATOR
16KHz BPF (SCF)
46KHz BPF (SCF)
LPF
FM DET
BUFFER
V REF
SCF CLOCK GENERATOR
11.89MHz X501
A Vcc
Vdd
IC501 (9) REC/PB
IC501 (6) PB
IC501 (18) REC
IC501 (15) PB
PS-308 BOARD (1/3)
(See Page 143)
IC950 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT PROTECT
PWM MOD
TRIANGLE OSC
X950 475KHz
Q950
BUFFER
UNREG (F950)
UNREG (F951)
Q953 SWITCHING
Q954 SWITCHING
L965
L964
CAP ON
CAP ERR
DRUM ERR
CN950
DRUM VS
CAP VS
(See Page 135)
SL-28 BOARD (1/3)
MECHA CHASSIS
(See Page 134)
IC505 (14),(16),(18) REC/PB
MOTOR UNREG (CN501 (29)(30))
SS 5V (CN501 (23))
VTR UNREG (W201 (14))
IC505 (1/2)
DRUM MOTOR DRIVE
OVER-HEAT PROTECT
ROTOR POSITION DETECT
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
LPF
SILENCER
Q502,510,511
R549-552 DRUM DRIVE CURRENT SENS
D504
DRUM ON
DRUM REV
DRUM BRK
DIR
BRAKE
M901 DRUM MOTOR
IC001 (1/2)
CAPSTAN MOTOR DRIVE
120° LOGIC
POWER OFF
HE POWER
STBY
CAP FWD/RVS
FRC
MOTOR UNREG (CN501 (29)(30))
SS 5V (CN501 (23))
M902 CAPSTAN MOTOR
CAP U
CAP V
CAP W
C HALL Vcc
H1 (+)
H1 (-)
H2 (+)
H2 (-)
H3 (+)
H3 (-)
C HALL GND

3-9. SYSTEM CONTROL BLOCK DIAGRAM


MA-155 BOARD (1/2)
(See Page 131)
IC401
REMOTE CONTROL RECEIVER
(See Page 132)
VK-28 BOARD (1/3)
S570 EJECT
S571 REW
S572 FF
S573 PB
S574 STOP
S576 PAUSE
SW-206 BOARD
S580 START/STOP
S581 STANBY
(See Page 133)
LITHIUM BATTERY
PJ-50 BOARD (1/3)
S550 EDIT
BUZZER
(See Page 131)
(See Page 133)
DK-24 BOARD
S561 COUNTER RESET
S562 ZERO MEMORY
S563 TAPE/BATT CHECK
CK-61 BOARD (1/2)
(See Page 132)
S560 PROGRAM AE
S564 DATE
S565 TIME
S566 EVENT
S568 FADER
S567 BACK LIGHT
S540 POWER
PLAYER
OFF
CAMERA
S542 REMOTE
S541 BEEP
(See Page 133)
PK-35 BOARD
(See Page 141)
VF-44 BOARD (1/2)
S502 EDIT SEARCH (-)
S501 EDIT SEARCH (+)
EVF BLOCK
CS-31 BOARD (1/7)
(See Page 107)
IC506
MODE CONTROL (MASTER)
IC509
SIRCS CONTROL
IC511
EEPROM
IC507
LITHIUM BATTERY PREEND DETECT
INITIAL RESET
BATTERY IN DETECT
IC508
5V REG
FL-53 BOARD
(See Page 133)
S400 AUTO FOCUS ON/OFF
CAMERA (1) BLOCK
J951 REMOTE
(See Page 143)
PS-308 BOARD (1/3)
IC502
LANC I/O
IC503 (1/2)
MECHANISM CONTROL
IC510
LOADING MOTOR DRIVE
SERVO
CAMERA (1)
IC501 (1/2)
WAVE SHAPER
IC501
SP/LP DETECT
CLOG DETECT
INTEGRATOR
SL-28 BOARD (1/3)
(See Page 135)
(See Page 134)
MECHA SHASSIS
LM-40 BOARD
M903 LOADING MOTOR
FP-442 BOARD
S001 MODE SWITCH
DEW SENSOR
Q001 TAPE TOP SENSOR
Q002 TAPE END SENSOR
D001 TAPE LED
S REEL FG SENSOR
T REEL FG SENSOR
S002
LS-33 BOARD
VIDEO (2)
VIDEO (1) (VA-77)
AUDIO (VA-77)

3-10. MECHANISM CONTROL MICROPROCESSOR PIN FUNCTION (IC503 ON CS-37 BOARD: CXP80624)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	11	CAP ON	O	MD	Capstan driver ON/OFF control signal. “H” when capstan ON.
2	PB4/PP012	CAP FWD/$\overline{\text{RVS}}$	O	MD	Capstan rotating direction control signal. “H”: FWD, “L”: RVS.
3	PB3/PP011	RP PB MODE	O	RP	REC/PB select signal of REC/PB amplifier (IC001 on CS-37 board) and ATF servo IC (IC501 on CS-37 board). “H”: PB.
4	PB2/PP010	$\overline{\text{FE ON}}$	O	RP	Flying erase oscillation ON/OFF control signal. “L”: oscillation.
5	PB1/PP09	JOG VD	O	VA	False VD signal to be inserted into playback video signal during variable speed playback.
6	PB0/PP08	JOG	O	VA	Variable speed/normal speed playback select signal of video circuit. “H” when variable speed playback.
7	PC7/RT07	JACK $\overline{\text{IN}}$/OUT	I	VA	Jack in/out switch input. “L” when input.
8	PC6/RT06	1.7M DET	I	VA	Not used.
9	PC5/RT05	JACK $\overline{\text{MONO}}$/STE DET	I	VA	
10	PC4/RT04	INT VD	I		
11	PC3/RT03	PB V (SYSTEM SYNC)	O	MODE CON	V sync for mode controller.
12	PC2/RT018	$\overline{\text{SYNC DET OUT}}$	O	VA	Sync detect output. “L” when Sync is detected.
13	PC1/RT017	E/$\overline{\text{L}}$ DET	I	VA	Not used.
14	PC0/RT016	MIC $\overline{\text{MONO}}$/ST DET	I	AU	
15	PJ7	M SW 0	I	MD	Mode switch input.
16	PJ6	M SW 1	I	MD	
17	PJ5	M SW 2	I	MD	
18	PJ4	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment down switch input. “L”: down.
19	PJ3	$\overline{\text{REC PROOF}}$	I	MD	Erasure protection switch input. “L” when REC prohibit.
20	PJ2	ME/$\overline{\text{MP}}$	I	MD	ME/MP switch input. “L”: MP, “H”: ME.
21	PJ1	HG/$\overline{\text{NOR}}$	I	MD	Connected to GND.
22	PJ0	VIDEO MUTE	O	VA	Video output mute signal. “H”: mute.
23	PD7	LINE MIX	I	VA	Not used.
24	PD6	MAT SEL 1	I	VA	
25	PD5	MAT SEL 2	I	VA	
26	PD4	MAT ON/$\overline{\text{OFF}}$	O	VA	
27	PD3	E MODE	O	VA	
28	PD2	CAM/$\overline{\text{LINE}}$	O	VA	Camera input/line input select signal. “H” when camera input.
29	PD1	DS ON	O	VA	Data screen ON/OFF signal. “H”: ON.
30	PD0	$\overline{\text{EDIT}}$	O	VA	Video circuit EDIT/NORMAL switch signal. “L”: EDIT.
31	PH7	UNLOAD	O	SS	Loading motor control signal. “H” or “H” pulse when unloading.
32	PH6	LOAD	O	SS	Loading motor control signal. “H” or “H” pulse when loading.
33	PH5	$\overline{\text{LM LIM COM}}$	O	SS	Loading motor limiter control signal. Temporary “H” when loading.
34	PH4	COMP REC	O	VA	Not used.
35	PH3	DRUM REV	O	SS	Drum rotating control signal . Normally “L”.
36	PH2		O		N.C.
37	PH1		O		
38	PH0	$\overline{\text{REEL HALL CONT}}$	O	SS	Reel FG sensor (HALL element) power supply control signal. Not used.
39	MP	MP			Connected to GND.
40	RST	$\overline{\text{RESET}}$	I	MODE CON	Reset signal from mode control microprocessor. “L” when reset.
41	VSS	VSS			GND
42	XTAL	XTAL	I	SS	11.89 MHz clock oscillation circuit.
43	EXTAL	EXTAL	O	SS	
44	CSO	$\overline{\text{COSMO CS}}$	I	MODE CON	Chip select signal from mode control microprocessor (CS-37 board IC506)
45	S10	DATA TO SLVE	I	MODE CON	Serial data input from mode control microprocessor.
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. “H”: mute.
49	PF6/AN10	1.7M ON/OFF	O	VA	Not used.
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally “L”, “H” pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally “L”, “H” pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. “L” when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by RB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EXI1	PG7 (N.C.)			Connected to GND.
64	PG6/EXI0	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP/LP DET	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. “L”: LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 33.3 msec period “H” pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 2.8 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 994 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period “H” pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μsec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μsec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	$\overline{\text{S JACK IN}}$			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LM LIMIT DET	I	SS	Loading motor limiter ON detection signal. Normally “H”, “L” when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. “H” when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. “L” when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=102.52 kHz, f2=118.95 kHz, f3=165.21 kHz and f4=148.69 kHz.
86	P10/PCK				Connected to +5V.
87	PKO	13/10 SW	I	MD	Connected to GND.
88	VSS	VSS			GND
89	VDD	VDD			VDD
90	N.C.	(VPP)			Connected to +5V.
91	PA7/PP07	DRUM ACC	O	SS	Drum motor acceleration signal. Normally “L”. “H” pulse when SLOW mode.
92	PA6/PP06	DRUM BRK	O	SS	Drum motor brake signal. Normally “L”.
93	PA5/PP05	SP/$\overline{\text{LP}}$	O	VA	SP/LP select signal. “L”: LP.
94	PA4/PP04		O		N.C.
95	PA3/PP03	VIDEO O SW	O	VA	VIDEO OUT inhibit signal. “H”: inhibit.
96	PA2/PP02	VIDEO I SW	O	VA	VIDEO IN/OUT select signal. “L”: VIDEO IN.
97	PA1/PP01	VA PB MODE	O	ALL	Video/audio circuit REC/PB select signal. “H”: PB.
98	PA0/PP00	VI SWP	O	VA	RF switching pulse signal for video circuit. 30 Hz, 50% duty pulse.
99	PB7/PP015	RF SWP	O	ALL	RF switching pulse signal for REC/PB amp and Audio circuit. 30 Hz, 50% duty pulse.
100	0	H CHG	O	VA	Not used.

	BL	END	EJECT	USE	LOAD	READY	TURN	REC/PB	FF
M SW 0	L	L	L	H	L	H	H	L	L
M SW 1	L	H	L	L	L	L	H	H	L
M SW 2	L	H	H	H	H	L	L	L	L

3-11. MODE CONTROL MICROPROCESSOR PIN FUNCTION (IC506 ON CS-37 BOARD: µPD75316)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	S12	S12	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
2	S13	S13	O		
3	S14	S14	O		
4	S15	S15	O		
5	S16	S16	O		
6	S17	S17	O		
7	S18	S18	O		
8	S19	S19	O		
9	S20	S20	O		
10	S21	S21	O		
11	S22	S22	O		
12	S23	S23	O		
13	S24/BP0	$\overline{\text{EEPROM CS}}$	O		Chip select signal to EEPROM (IC511 on CS-37 board). 1/2V period "L" pulse.
14	S25/BP1	TG STBY 1	O	CAM	Power save control signal to timing generator (IC801 on CS-37 board). Normally "L".
15	S26/BP2	AUDIO IN/$\overline{\text{OUT}}$	O	AU	Audio input/output control signal. "H": input. "L": output.
16	S27/BP3		O		N.C.
17	S28/BP4	TITLE CS	O	CAM	Not used.
18	S29/BP5	REMO CS	O		Chip select signal to sircs remote controller (IC509 on CS-37 board). 1V period "L" pulse.
19	S30/BP6	S RAM CS	O		Not used.
20	S31/BP7	$\overline{\text{CAM COSM CS}}$	O	CAM	Chip select signal to camera controller (IC709 on CS-37 board). 1V period "L" pulse.
21	COM0	COM 0	O		Common terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
22	COM1	COM 1	O		
23	COM2	COM 2	O		
24	COM3	COM 3	O		
25	BIAS	BIAS	O		Bias voltage output for voltage deviding resistor. Not used.
26	VLC0	VCC 0	I		Power source 0 input Power source for LCD dirve. Not used.
27	VLC1	VCC 1	I		Power source 1 input
28	VLC2	VCC 2	I		Power source 2 input
29	P40	K OUT 4	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
30	P41	K OUT 5	O	all	
31	P42	$\overline{\text{SYS RESET}}$	O	all	Output signal to reset each IC when power is turned on. Normally "H".
32	P43	$\overline{\text{TALLY}}$	O	EVF	Tally LED ON/OFF signal. "L": ON.
33	VSS	VSS			GND
34	P50	K OUT 0	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
35	P51	K OUT 1	O	all	
36	P52	K OUT 2	O	all	
37	P53	K OUT 3	O	all	
38	P00/INT4	$\overline{\text{BATT IN}}$	I		Clock select to 32 kHz when "L" and to 4.19 MHz with "H" when Battery is turned on. "L" is select.
39	P01/$\overline{\text{SCK}}$	SCK	O	all	Serial clock output terminal, Serial clock (2 μS) communication.
40	P02/SO/SB0	DATA TO SLVE	O	all	Serial bus output terminal, Serial clock (2 μS) communication.
41	P03/SI/SB1	DATA TO MSTR	I	all	Serial bus input terminal, Serial clock (2 μS) communication.
42	P10/INT0	SYSTEM SYNC	I	all	(Edge detection vector interruption), System synchronization input port from CXP80624 (IC503 on CS-37 board).
43	P11/INT1	$\overline{\text{LI PRE END}}$	I		(Edge detection vector interruption), Lithium PRE END is selected with "L".
44	P12/INT2	$\overline{\text{LANC PWR ON}}$	I		Power on signal input from wired remote control. "L" when power switch pressed.
45	P13/TIO	TITLE BUSY	I	CAM	Not used.
46	P20/PT00	VTR ON	O	PS	VTR power source (SS5V, VIDEO 5V, AUDIO 5V, EVF 5V, D5V, D4V) control signal. "H" when power switch is in "PLAYER" or "CAMERA" position.
47	P21	CAM ON	O	PS	CAMERA power source (CAM 5V, +15V, –9V) control signal. "H" when power switch is in "CAMERA" position.
48	P22/PCL	$\overline{\text{VIDEO D/A CS}}$	O	VA	Serial data load signal to video circuit EVR (IC203, 204 on VA-77 board). 1V period "H" pulse.
49	P23/BUZ	BUZ	O		Buzzer output. Normally "L". 2 kHz pulse: alarm.
50	P30/LCDCL	$\overline{\text{VIDEO CS}}$	O	VA	Chip select signal to Y process IC (IC201 on VA-77 board). 1V period "L" pulse.
51	P31/SYNC	$\overline{\text{VTR COSM CS}}$	O		Chip select signal to mechanism controller (IC503 on CS-37 board). 1V period "L" pulse.
52	P32	$\overline{\text{SG CS}}$	O	CAM	Chip select signal to sync generator (IC704 on CS-37 board). 1V period "L" pulse.
53	P33	$\overline{\text{CRTC CS}}$	O	CAM	Strobe signal for character generator (IC703 on CS-37 board). 1V period "H" pulse.
54	VDD	VDD			VDD
55	XT1	XT1	I		SUB system clock. 32 kHz oscillation terminal.
56	XT2	XT2			
57	N.C.	N.C.			N.C.
58	X1	X1	I		Main system clock. 4.19 MHz oscillation terminal.
59	X2	X2	I		
60	P60/KK0	K IN 0	I	all	KEY matrix input. 1V period "L" pulse input when corresponding key is pressed. "H" when other case.
61	P61/KR1	K IN 1	I	all	
62	P62/KR2	K IN 2	I	all	
63	P63/KR3	K IN 3	I	all	
64	P70/KR4	K IN 4	I	all	
65	P71/KP5	K IN 5	I	all	
66	P72/KP6	K IN 6	I	all	Cassette compartment lock switch input. "L": Lock.
67	P73/KP7	$\overline{\text{CC DOWN}}$	I	MD	System reset input. "L": Reset, Normally: "H".
68	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	I		N.C.
69	S0	CLK CHK	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
70	S1	S1	O		
71	S2	S2	O		
72	S3	S3	O		
73	S4	S4	O		
74	S5	S5	O		
75	S6	S6	O		
76	S7	S7	O		
77	S8	S8	O		
78	S9	S9	O		
79	S10	S10	O		
80	S11	S11	O		

3-12. INTERFACE

3-12-1. System Control – Video/Audio Block Interface (CS-37 BOARD)

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *3		REC *4	REC *4 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
SP/LP	O	IC503 (93)	*1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*1	*2	*2	H	H	H	H	*2	*2	H	H
VA PB MODE	O	IC503 (97)	L	L	L	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE *13	O	IC503 ㊽	L	L	L	H	H	L	H	H	H	H	H	L	H	H	L	L	L	L	H	H	H	H
VIDEO MUTE	O	IC503 ㉒	*14	*14	*14	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*14	*14	L	L	*15	*15	*15	*15
CAM/LINE	O	IC503 ㉘	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L
JOG VD	O	IC503 ⑤	L	L	L	*5	*5	L	*5	*5	*5	*5	*5	*5	*5	*5	L	L	L	L	*5	*5	*5	*5
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
FE ON	O	IC503 ④	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
RF SWP	O	IC503 (99)	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
JOG	O	IC503 ⑥	L	L	L	H	H	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
VIDEO CS	O	IC506 ㊿	V period "L" pulse																					
VIDEO D/A CS	O	IC506 ㊽	V period 'H" pulse																					
DATA TO MSTR	I	IC506 ㊶	V period "L" pulse																					
DATA TO SLVE	O	IC506 ㊵	V period pulse train																					
SCK	I	IC506 ㊴	V period "H" pulse																					
PB SP/LP DET	I	IC503 (67)	L	*10	*10	*10	*10	L	*10	*10	*10			*10	L	*10	H	H	H	H	L	*10	L	*10
CLOG	I	IC503 (84)	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H	*11	*11	H	*11	*11	*11	*11
VTR SYNC	I	IC503 (66)	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

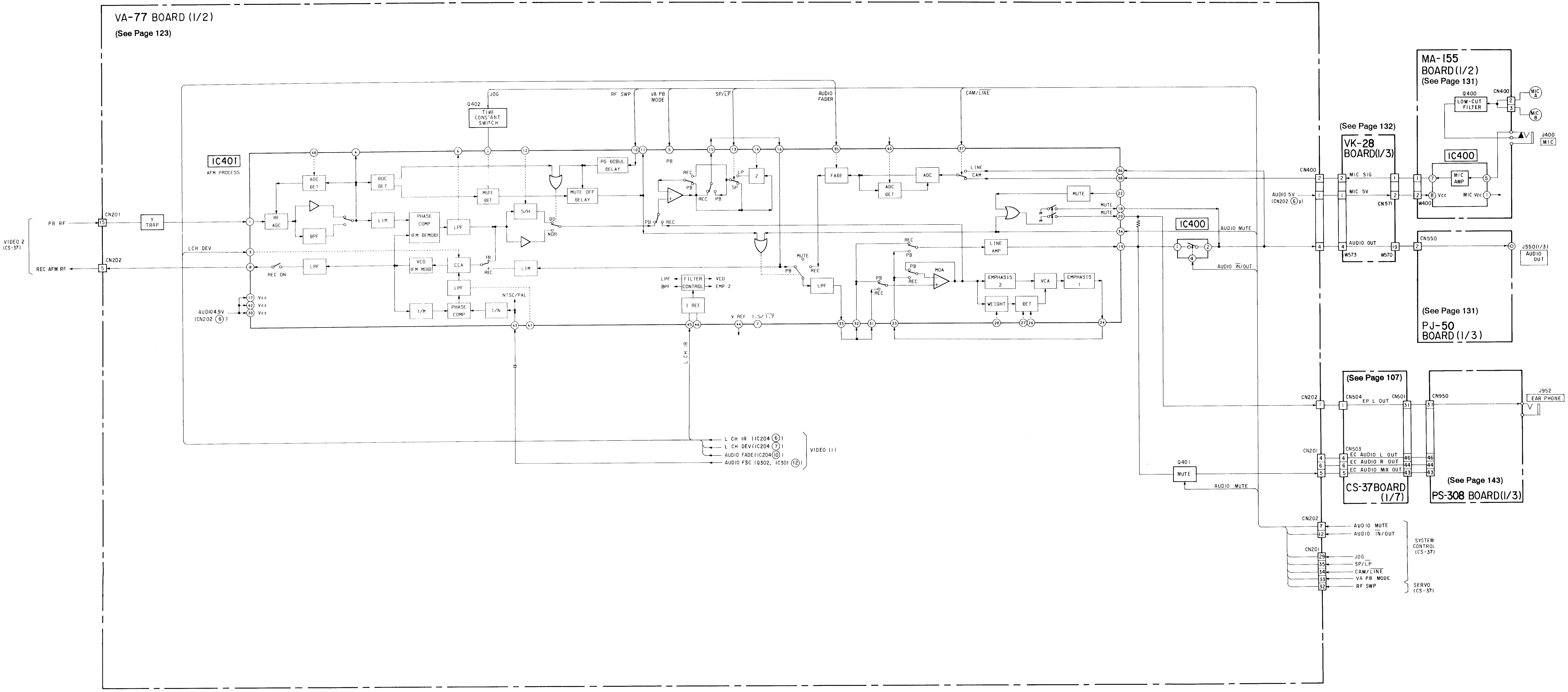
*1. Outputs discrimination result of the mode just before. "H": SP mode, "L": LP mode.
*2. Outputs discrimination result of the playback tape. "H" : SP mode, "L": LP mode.
*3. Edit search button pressed when playback pause mode.
*4. Mode for adjustment.
*5. False VD signal
*7. 30 Hz duty 50% pulse (synchronized with drum rotation)
*10. "H": SP recording area on tape. "L": LP recording area.
*11. "H": no recording area or drop out area on tape. Head clog detection input.
*12. Composite sync signal input separated from line input video signal, camera video signal or playback video signal. (polarity +)
*13. "H" during camera mode load/unload.
*14. "L" when external input (video) present. "H" when other cases.
*15. "H" when tape no signal. "L" when other cases.

3-12-2. System Control — Servo Block Interface

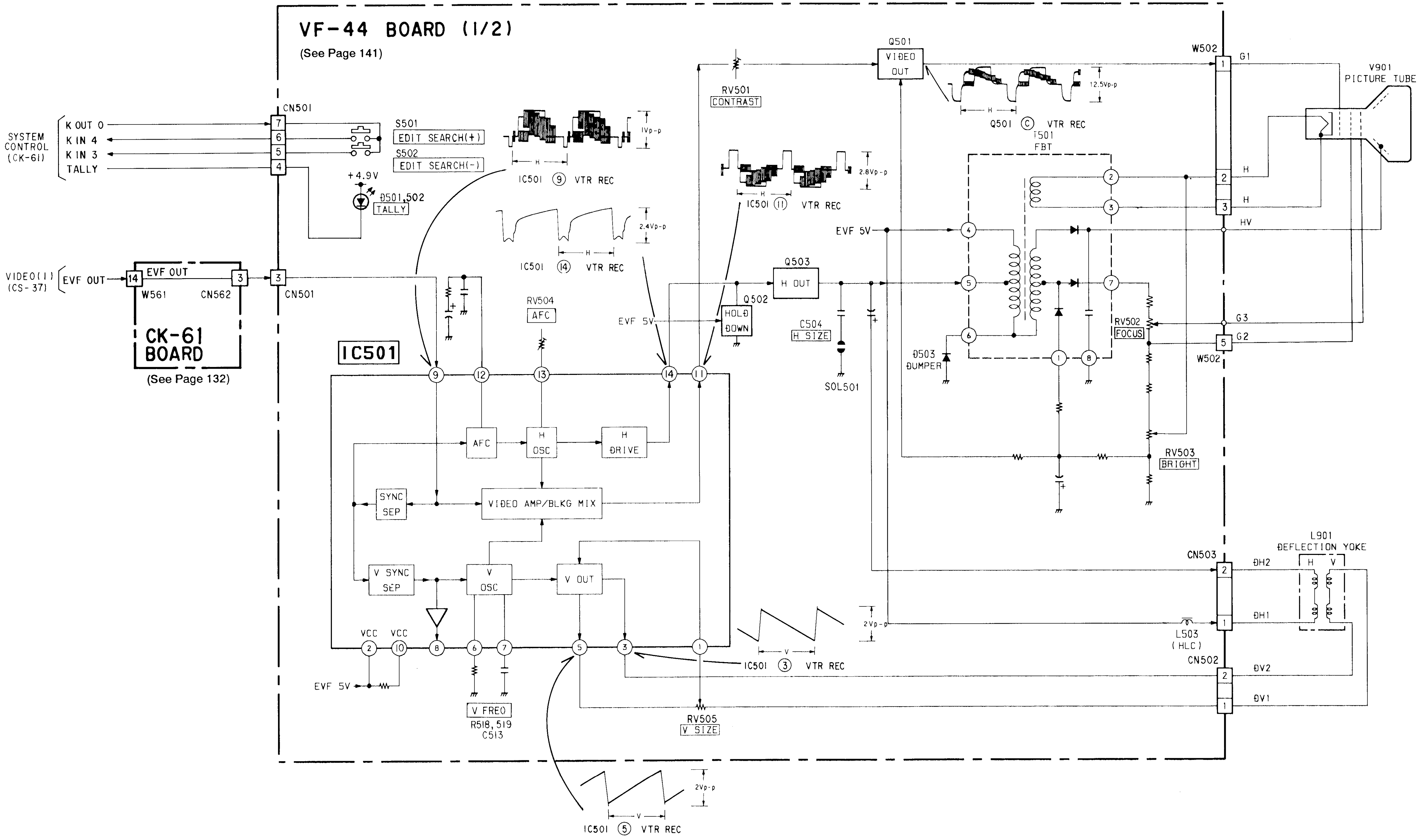
NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *13		REC *14	REC *14 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
T.REEL FG	I	IC503 ㊷	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
S.REEL FG	I	IC503 (61)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
ATF ERROR	I	IC503 (60)	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	IC503 (68)	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	IC503 (69)	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG/ CFG HMS	I	IC503 (70), (77)	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	IC503 ①	L	H	H	H	H	H	H	H	L	*8	*8	H	H	H	H	L	L	H	H	H	H	H
REF PILOT	O	IC503 (85)	*7	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
DRUM FWD/$\overline{\text{RVS}}$ *10	O	IC503 ㉟	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP FWD/ $\overline{\text{RVS}}$	O	IC503 ②	L	H	L	H	L	H	H	L	L	*8	*8	H	H	L	H	L	L	H	H	L	H	L
DRUM PWM	O	IC503 (76)	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
CAP PWM	O	IC503 (75)	L	*9	*9	*9	*9	*9	*9	*9	L	*9	*9	*9	*9	*9	*9	L	L	*9	*9	*9	*9	*9
$\overline{\text{LM LIM CONT}}$ *11	O	IC503 ㉝	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON *12	O	IC503 (83)	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DRUM ACC	O	IC503 (91)	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L
DRUM BRK	O	IC503 (92)	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L

*1. *Inputting waveform which is similar to sine wave according to reel rotation.*
*2. ATF error voltage input
*3. One PG pulse input per one drum rotation, approx. 30 Hz.
*4. 12 FG pulses input per one drum rotation, approx. 360 Hz.
*5. 520 FG pulses input per one capstan rotation. Approx. 994 Hz when REC/PB (SP). 498 Hz when PB (LP).
*6. Four frequencies output synchronized with drum rotation. f1=102.54 kHz, f2=118.95 kHz, f3=165.21 kHz and f4=148.69 kHz
*7. f2 (118.95 kHz) output
*8. "H" pulse when tape run.
*9. 21.5 μsec period PWM signal
*10. Normally "H". Temporary "L" when load (drum reverse rotation).
*11. Temporary "H" when cassette loading (finger catch protection).
*12. "H": approx. 1.3 Vdc
*13. Edit search button pressed when playback pause mode.
*14. Mode for adjustment

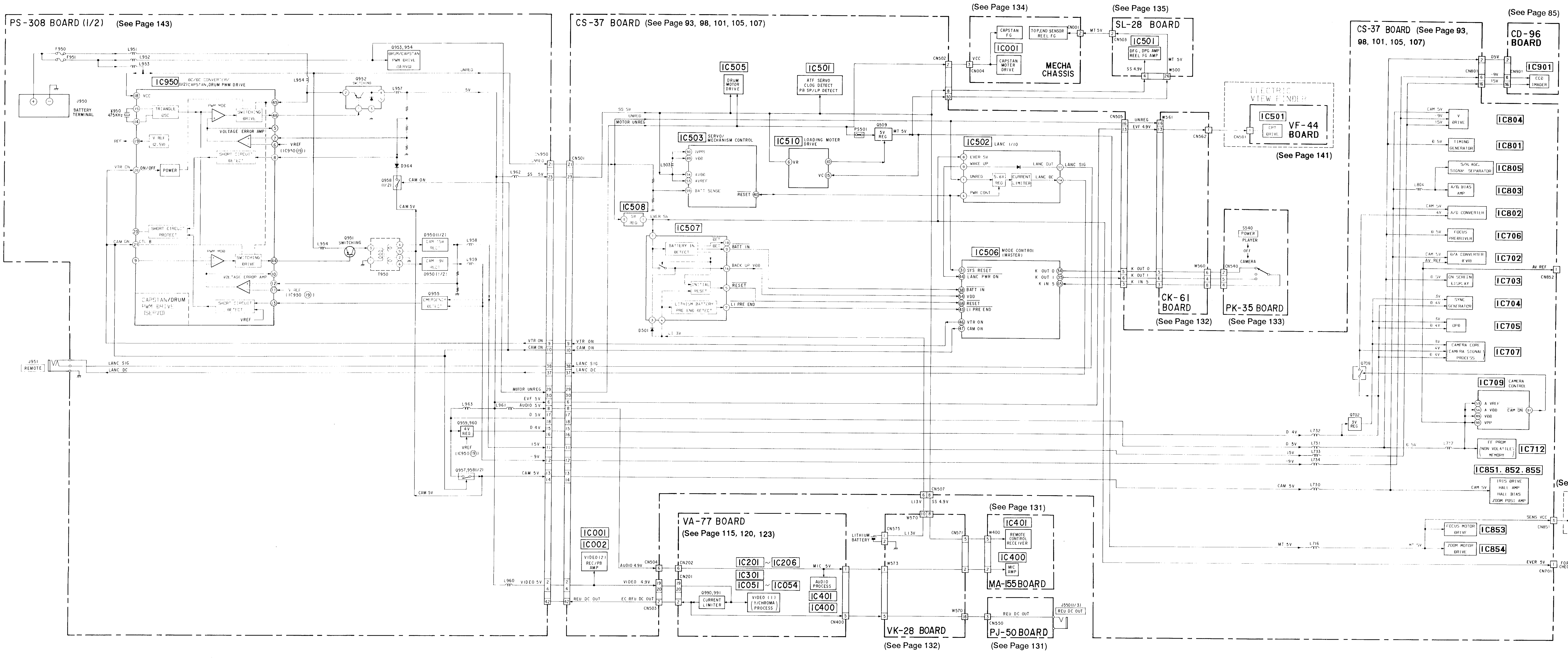
3-13. AUDIO BLOCK DIAGRAM


VA-77 BOARD (1/2)
(See Page 123)
IC401
AFM PROCESS
Q402
TIME CONSTANT SWITCH
JOG
RF SWP
VA PB MODE
SP/LP
AUDIO FADER
CAM/LINE
AGC DET
DOC DET
MUTE DET
PG 60BUL DELAY
MUTE OFF DELAY
RF AGC
BPF
LIM
PHASE COMP (FM DEMOD)
LPF
S/H
BD
NDR
VCO (FM MOD)
CCA
LIM
LPF
1/M
PHASE COMP
1/N
NTSC/PAL
REC ON
LCH DEV
Y TRAP
PB RF
REC AFM RF
VIDEO 2 (CS-37)
CN201
CN202
AUDIO4.9V (CN202 ⑥)
Vcc
FILTER CONTROL
LPF
BPF
VCO
EMP 2
I REF
V REF
1.5/1.7
L CH IR
FADE
AGC
AGC DET
LINE
CAM
MUTE
LINE AMP
MOA
EMPHASIS 2
VCA
EMPHASIS 1
WEIGHT
DET
REC
PB
IC400
AUDIO MUTE
AUDIO IN/OUT
AUDIO 5V (CN202 ⑥)
CN400
L CH IR (IC204 ⑥)
L CH DEV (IC204 ⑦)
AUDIO FADE (IC204 ⑩)
AUDIO FSC (Q302, IC301 ⑫)
VIDEO (1)
(See Page 132)
VK-28 BOARD (1/3)
MIC SIG
MIC 5V
AUDIO OUT
CN571
W573
W570
MA-155 BOARD (1/2)
(See Page 131)
Q400
LOW-CUT FILTER
CN400
MIC A
MIC B
J400 MIC
IC400
MIC AMP
Vcc
MIC Vcc
W400
CN550
J550 (1/3) AUDIO OUT
(See Page 131)
PJ-50 BOARD (1/3)
(See Page 107)
CN504
EP L OUT
CN501
CN950
J952 EAR PHONE
CN503
EC AUDIO L OUT
EC AUDIO R OUT
EC AUDIO MIX OUT
CS-37 BOARD (1/7)
(See Page 143)
PS-308 BOARD (1/3)
Q401
MUTE
AUDIO MUTE
CN202
AUDIO MUTE
AUDIO IN/OUT
SYSTEM CONTROL (CS-37)
CN201
JOG
SP/LP
CAM/LINE
VA PB MODE
RF SWP
SERVO (CS-37)

3-14. EVF BLOCK DIAGRAM

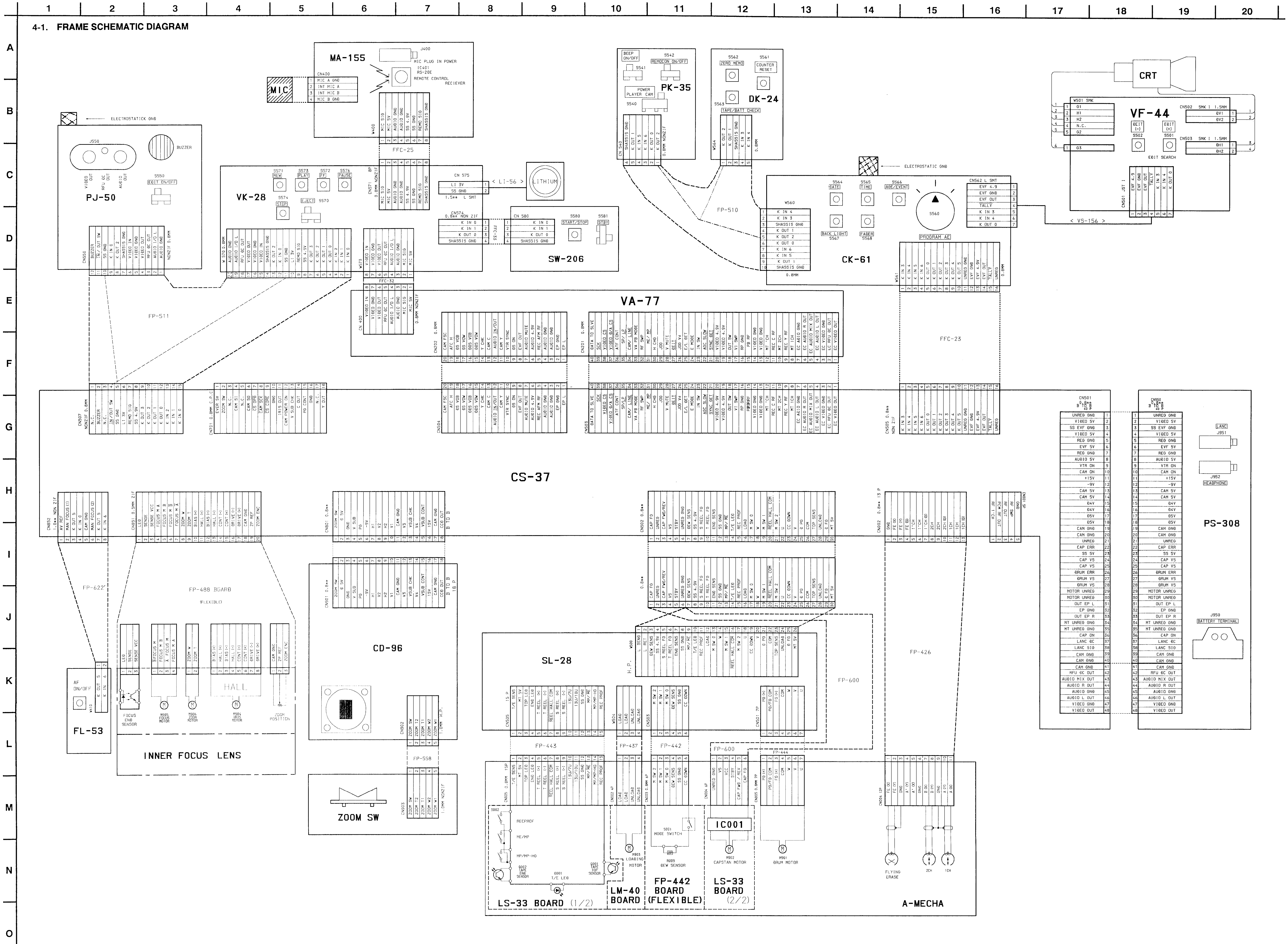

VF-44 BOARD (1/2)
(See Page 141)
SYSTEM CONTROL (CK-61)
K OUT 0
K IN 4
K IN 3
TALLY
CN501
S501
EDIT SEARCH(+)
S502
EDIT SEARCH(-)
+4.9V
D501,502
TALLY
VIDEO(1) (CS-37)
EVF OUT
EVF OUT
W561
CN562
CK-61 BOARD
(See Page 132)
IC501
IC501 ⑨ VTR REC
1Vp-p
IC501 ⑭ VTR REC
2.4Vp-p
RV504
AFC
IC501 ⑪ VTR REC
2.8Vp-p
RV501
CONTRAST
Q501
VIDEO OUT
Q501 © VTR REC
12.5Vp-p
T501
FBT
W502
G1
V901
PICTURE TUBE
H
H
HV
G3
G2
EVF 5V
Q503
H OUT
Q502
HOLD DOWN
C504
H SIZE
SOL501
D503
DUMPER
RV502
FOCUS
RV503
BRIGHT
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
VCC
VCC
EVF 5V
V FREQ
R518, 519
C513
RV505
V SIZE
IC501 ③ VTR REC
2Vp-p
L901
DEFLECTION YOKE
CN503
DH2
DH1
L503
(HLC)
CN502
DV2
DV1
IC501 ⑤ VTR REC
2Vp-p

3-15. POWER BLOCK DIAGRAM


PS-308 BOARD (1/2) (See Page 143)
J950 BATTERY TERMINAL
F950
F951
L951
L952
L953
L954
IC950 DC/DC CONVERTER/ (1/2) CAPSTAN, DRUM PWM DRIVE
X950 475KHz
TRIANGLE OSC
PWM MOD
SWITCHING DRIVE
VOLTAGE ERROR AMP
V REF (2.5V)
SHORT CIRCUIT DETECT
POWER
VTR ON
CAM ON
CAPSTAN/DRUM PWM DRIVE (SERVO)
Q953, 954 DRUM/CAPSTAN PWM DRIVE (SERVO)
Q952 SWITCHING
Q951 SWITCHING
T950
D964
Q958 (1/2)
D950 (1/2)
Q955 EMERGENCY DETECT
Q959, 960 4V REG
Q957, 958 (1/2)
J951 REMOTE
LANC SIG
LANC DC
UNREG
5V
CAM 5V
MOTOR UNREG
EVF 5V
AUDIO 5V
D 5V
D 4V
15V
-9V
VIDEO 5V
REU DC OUT
CS-37 BOARD (See Page 93, 98, 101, 105, 107)
IC505 DRUM MOTOR DRIVE
IC501 ATF SERVO CLOG DETECT PB SP/LP DETECT
IC503 SERVO/ MECHANISM CONTROL
IC510 LOADING MOTOR DRIVE
IC508 5V REG
IC507
IC502 LANC I/O
IC506 MODE CONTROL (MASTER)
Q509 5V REG
PS501
SS 5V
EVER 5V
BATT IN
BACK UP VDD
RESET
LI PRE END
INITIAL RESET
LITHIUM BATTERY PRE END DETECT
SYS RESET
LANC PWR ON
K OUT 0
K OUT 1
K IN 5
CN501
CN502
CN504
CN505
CN507
(See Page 134)
IC001 CAPSTAN MOTOR DRIVE
CAPSTAN FG
TOP,END SENSOR REEL FG
MECHA CHASSIS
(See Page 135)
SL-28 BOARD
IC501 DFG, DPG AMP REEL FG AMP
MT 5V
ELECTRIC VIEW FINDER
IC501 CRT DRIVE
VF-44 BOARD
(See Page 141)
CK-61 BOARD
(See Page 132)
PK-35 BOARD
(See Page 133)
S540 POWER PLAYER OFF CAMERA
IC001
IC002
VIDEO (2) REC/PB AMP
VA-77 BOARD
(See Page 115, 120, 123)
IC201 ~ IC206
IC301
IC051 ~ IC054
IC401
IC400
Q990, 991 CURRENT LIMITER
VIDEO (1) (Y/CHROMA) PROCESS
AUDIO PROCESS
LITHIUM BATTERY
VK-28 BOARD
(See Page 132)
(See Page 131)
IC401 REMOTE CONTROL RECEIVER
IC400 MIC AMP
MA-155 BOARD
PJ-50 BOARD
(See Page 131)
J550 (1/3) REU DC OUT
CS-37 BOARD (See Page 93, 98, 101, 105, 107)
(See Page 85)
CD-96 BOARD
IC901 CCD IMAGER
IC804 V DRIVE
IC801 TIMING GENERATOR
IC805 S/H, AGC, SIGNAL SEPARATOR
IC803 A/D BIAS AMP
IC802 A/D CONVERTER
IC706 FOCUS PREDRIVER
IC702 D/A CONVERTER 8 VIB
IC703 ON SCREEN DISPLAY
IC704 SYNC GENERATOR
IC705 DPD
IC707 CAMERA CORE CAMERA SIGNAL PROCESS
IC709 CAMERA CONTROL
Q702 3V REG
Q708
IC712 EE PROM (NON VOLATILE) MEMORY
IC851, 852, 855 IRIS DRIVE HALL AMP HALL BIAS ZOOM POSI AMP
(See Page 101)
LENS BLOCK FOCUS END FAR SENSOR
IC853 FOCUS MOTOR DRIVE
IC854 ZOOM MOTOR DRIVE
EVER 5V
CN701 FOR CHECK

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


MA-155
MIC
J400 MIC PLUG IN POWER
IC401 RS-20E REMOTE CONTROL RECIEVER
CN400
PK-35
BEEP ON/OFF
S542 REMOCON ON/OFF
POWER PLAYER CAM
DK-24
S562 ZERO MEMO
S561 COUNTER RESET
TAPE/BATT CHECK
CRT
VF-44
EDIT SEARCH
ELECTROSTATICK GND
PJ-50
BUZZER
S550 EDIT ON/OFF
VIDEO OUT
RFU DC OUT
AUDIO OUT
VK-28
S571 REW
S573 PLAY
S572 FF
S576 PAUSE
S574 STOP
S570 EJECT
FFC-25
CN 575
< LI-56 >
LITHIUM
ELECTROSTATIC GND
CK-61
S564 DATE
S565 TIME
S566 AGE/EVENT
S560
S567 BACK LIGHT
S568 FADER
PROGRAM AE
FP-510
FFC-32
SW-206
S580 START/STOP
S581 STBY
< VS-156 >
FP-511
VA-77
FFC-23
CS-37
PS-308
J951 LANC
J952 HEADPHONE
J950 BATTERY TERMINAL
FP-622
FP-488 BOARD (FLEXIBLE)
CD-96
SL-28
FP-426
FP-600
AF ON/OFF
FL-53
FOCUS END SENSOR
M905 FOCUS MOTOR
M904 ZOOM MOTOR
HALL
M906 IRIS MOTOR
ZOOM POSITION
INNER FOCUS LENS
ZOOM SW
FP-558
FP-443
FP-437
FP-442
FP-444
RECPROF
ME/MP
MP/MP-HG
Q002 TAPE END SENSOR
D001 T/E LED
Q001 TAPE TOP SENSOR
LS-33 BOARD (1/2)
M903 LOADING MOTOR
LM-40 BOARD
S001 MODE SWITCH
R009 DEW SENSOR
FP-442 BOARD (FLEXIBLE)
IC001
M902 CAPSTAN MOTOR
LS-33 BOARD (2/2)
M901 DRUM MOTOR
FLYING ERASE
2CH
1CH
A-MECHA

FRAME **FRAME**

FRAME

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○ : Through hole
- ▨ : Pattern from the side which enables seeing.
  (The other layer's patterns are not indicated.)

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

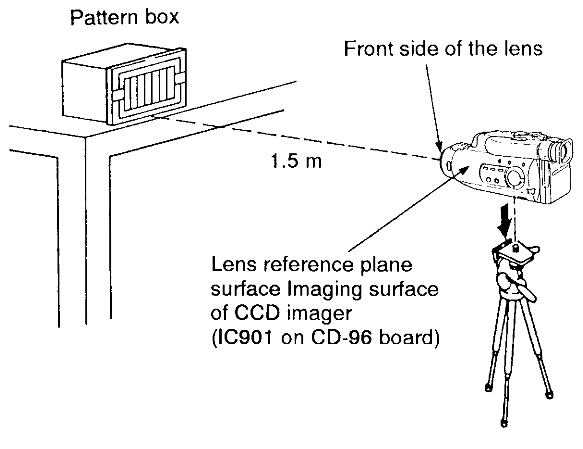
- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- Chip resistor are 1/16W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μ μF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ─∿─ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repeair.*
- ━━ : B+ Line.*
- ╍╍╍ : B– Line.*
- ⇛ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

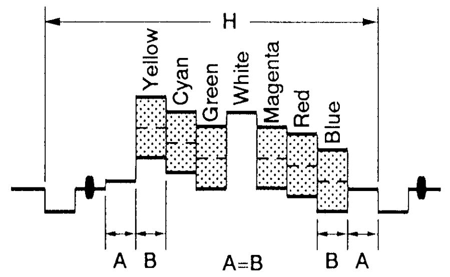
- **Measuring conditions voltage value and waveform.**
(CAMERA, DIGITAL TITLE block)
- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.*
  Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection



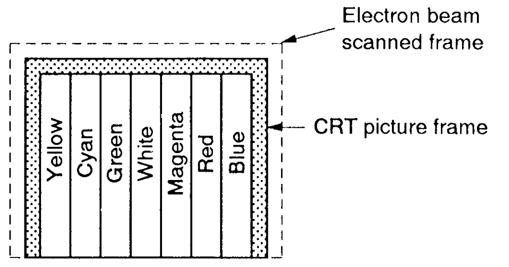
Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imaging surface of CCD imager (IC901 on CD-96 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.



H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A
B
A=B
B
A

Fig. a (Video output terminal output waveform)



Electron beam scanned frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

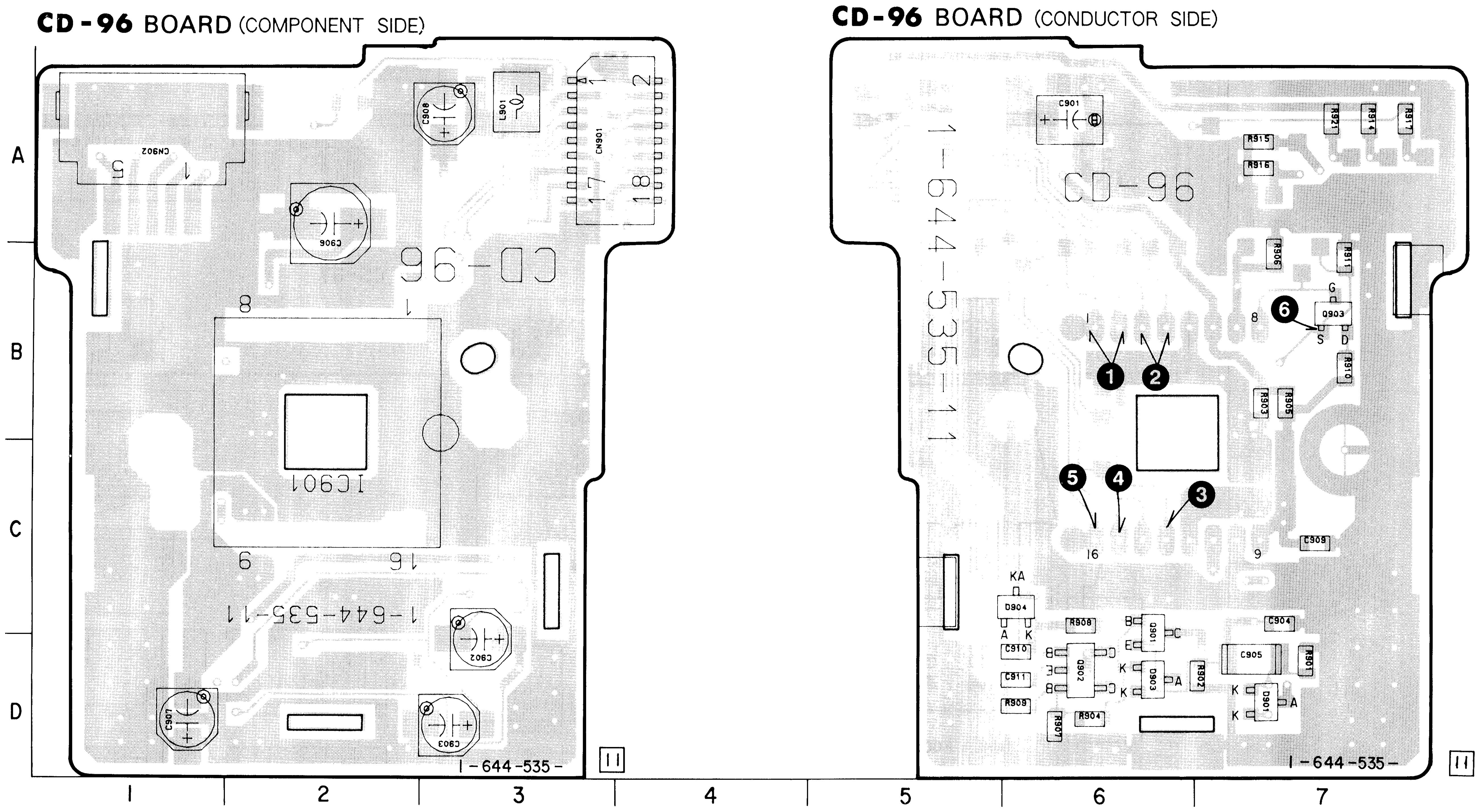
Fig. (Picture on monitor TV)

(VIDEO, SERVO/SYSTEM CONTROL, VIEW FINDER block)
- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

*: indicated by the color red.

CD-96 (CCD DRIVE) PRINTED WIRING BOARD

— Ref. No. CD-96 BOARD: 1000 series —



CD-96 BOARD (COMPONENT SIDE)
CD-96 BOARD (CONDUCTOR SIDE)
A
B
C
D
1
2
3
4
5
6
7
CN902
5
1
C908
L901
CN901
1
2
17
18
C906
CD-96
8
IC901
9
16
1-644-535-11
C902
C907
C903
1-644-535-
11
C901
R921
R814
R811
R815
R816
R806
R911
R910
R903
R905
Q903
G
S
D
1
2
3
4
5
6
C909
KA
D904
A
K
C910
C911
R909
R908
Q902
Q901
C904
C905
R901
R902
R904
R907
D901

(DIODE)

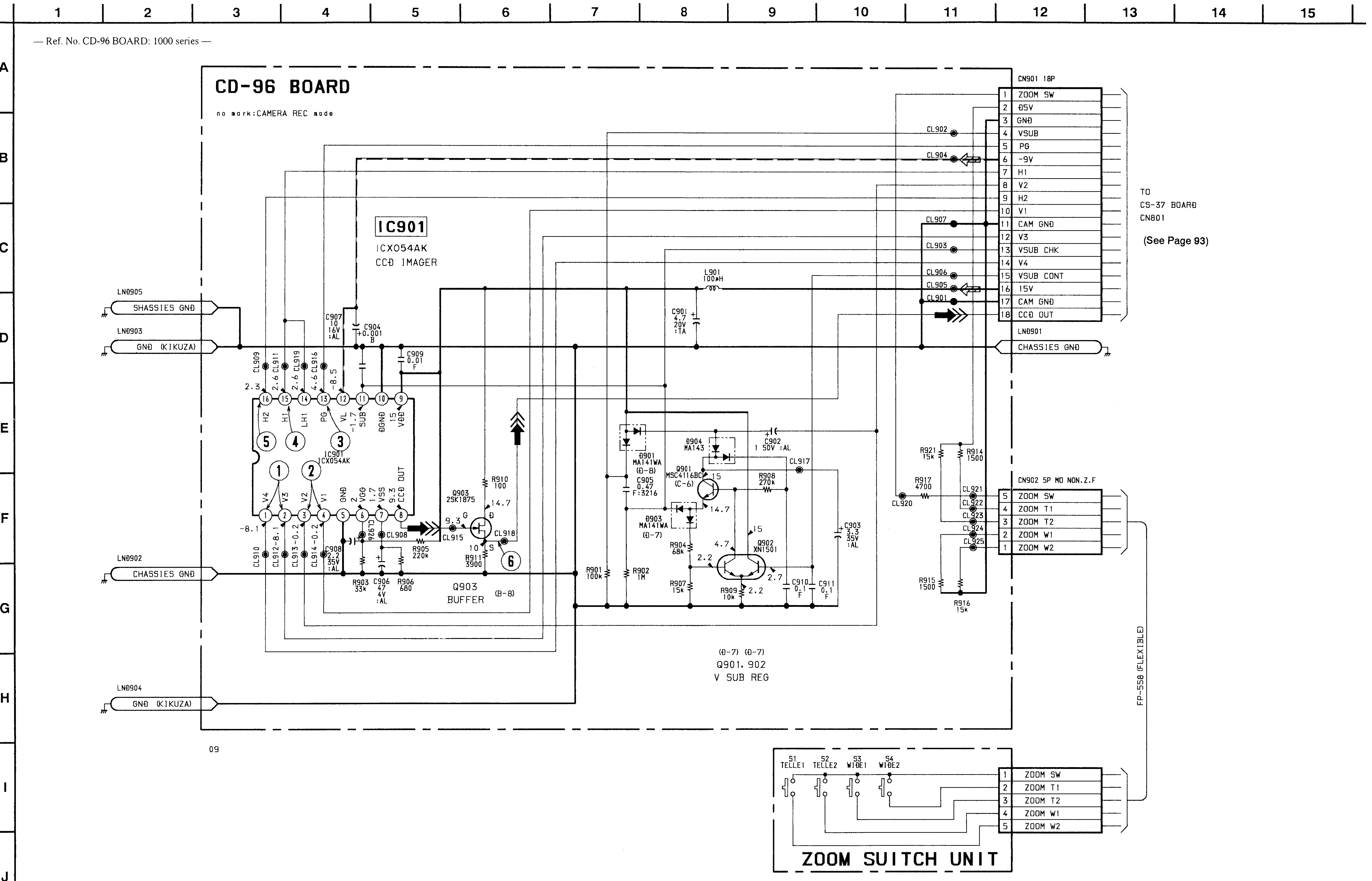
D901	8-719-820-05	DIODE	1SS181
D903	8-719-820-05	DIODE	1SS181
D904	8-719-800-76	DIODE	1SS226

(TRANSISTOR)

Q901	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q902	8-729-402-13	TRANSISTOR	XN1501-TX
Q903	8-729-232-86	TRANSISTOR	2SK1875

CD-96 (CCD DRIVE) SCHEMATIC DIAGRAM

— Ref. No. CD-96 BOARD: 1000 series —

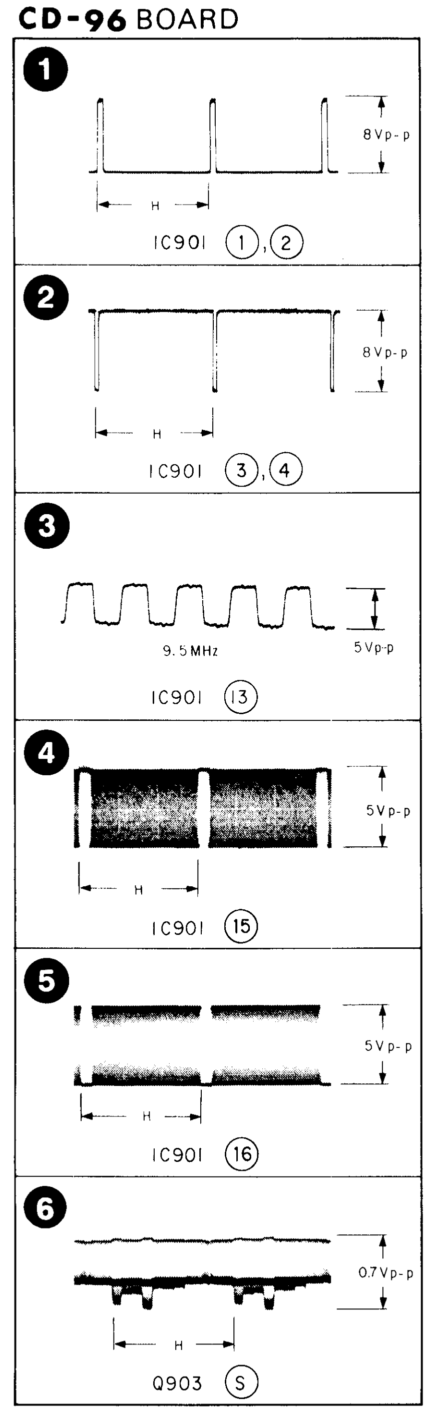

CD-96 BOARD
no mark:CAMERA REC mode
IC901
ICX054AK
CCD IMAGER
LND905 CHASSIES GND
LND903 GND (KIKUZA)
LND902 CHASSIES GND
LND904 GND (KIKUZA)
CN901 18P
1 ZOOM SW
2 D5V
3 GND
4 VSUB
5 PG
6 -9V
7 H1
8 V2
9 H2
10 V1
11 CAM GND
12 V3
13 VSUB CHK
14 V4
15 VSUB CONT
16 15V
17 CAM GND
18 CCD OUT
LND901 CHASSIES GND
TO
CS-37 BOARD
CN801
(See Page 93)
Q903 2SK1875
Q903 BUFFER (B-8)
Q901, 902 V SUB REG
Q901 MSC4116BC
Q902 XN1501
D901 MA141WA
D903 MA141WA
D904 MA143
L901 100μH
CN902 5P MD NON.Z.F
5 ZOOM SW
4 ZOOM T1
3 ZOOM T2
2 ZOOM W1
1 ZOOM W2
FP-558 (FLEXIBLE)
S1 TELLE1
S2 TELLE2
S3 WIDE1
S4 WIDE2
1 ZOOM SW
2 ZOOM T1
3 ZOOM T2
4 ZOOM W1
5 ZOOM W2
ZOOM SUITCH UNIT
09

Note on the CCD imager replacement

- Some of this units require the correction data by the CCD imager (IC901 on CD-96 board), some do not.
  The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC709 on CS-37 board), and also written on the CCD data label put on the shield case (upper) of the PS-308 board.
  The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted CD-96 board supplied as the repair parts.
  When replacing the CD-96 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure.
  Also, prevent the receiving light section from dust attached and strong light.

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	
PB				



CS-37 (CAMERA, REC/PB AMP, SERVO/SYSTEM CONTROL), FP-488 (INNER FOCUS LENS) PRINTED WIRING BOARDS

— Ref. No. CS-37 BOARD: 1000 series —

(DIODE)

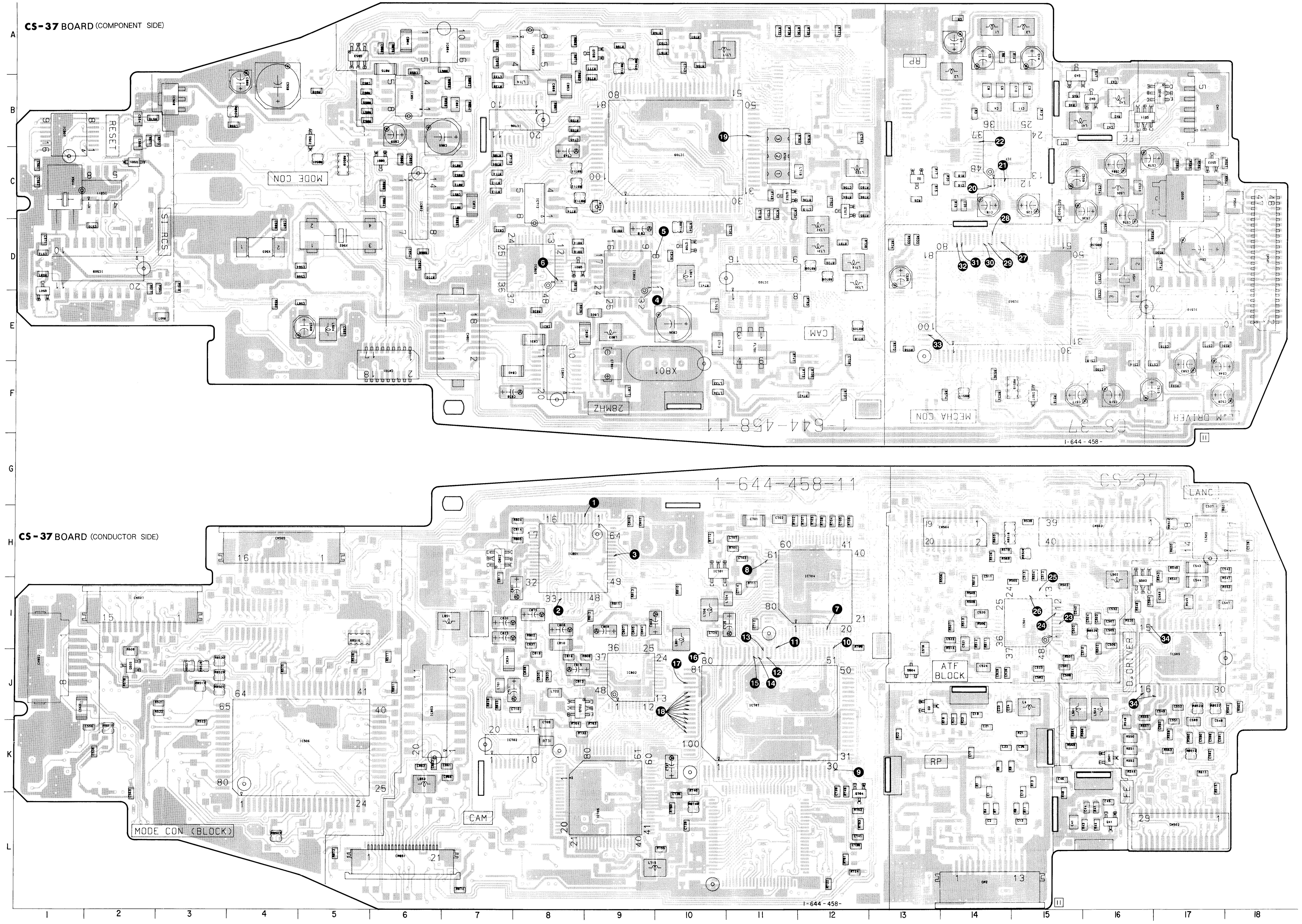
D501	8-719-421-27	DIODE	MA728
D502	8-719-404-46	DIODE	MA110
D503	8-719-110-03	DIODE	RD7, 5ES-B2
D504	8-719-941-86	DIODE	DAN202U
D507	8-719-404-46	DIODE	MA110

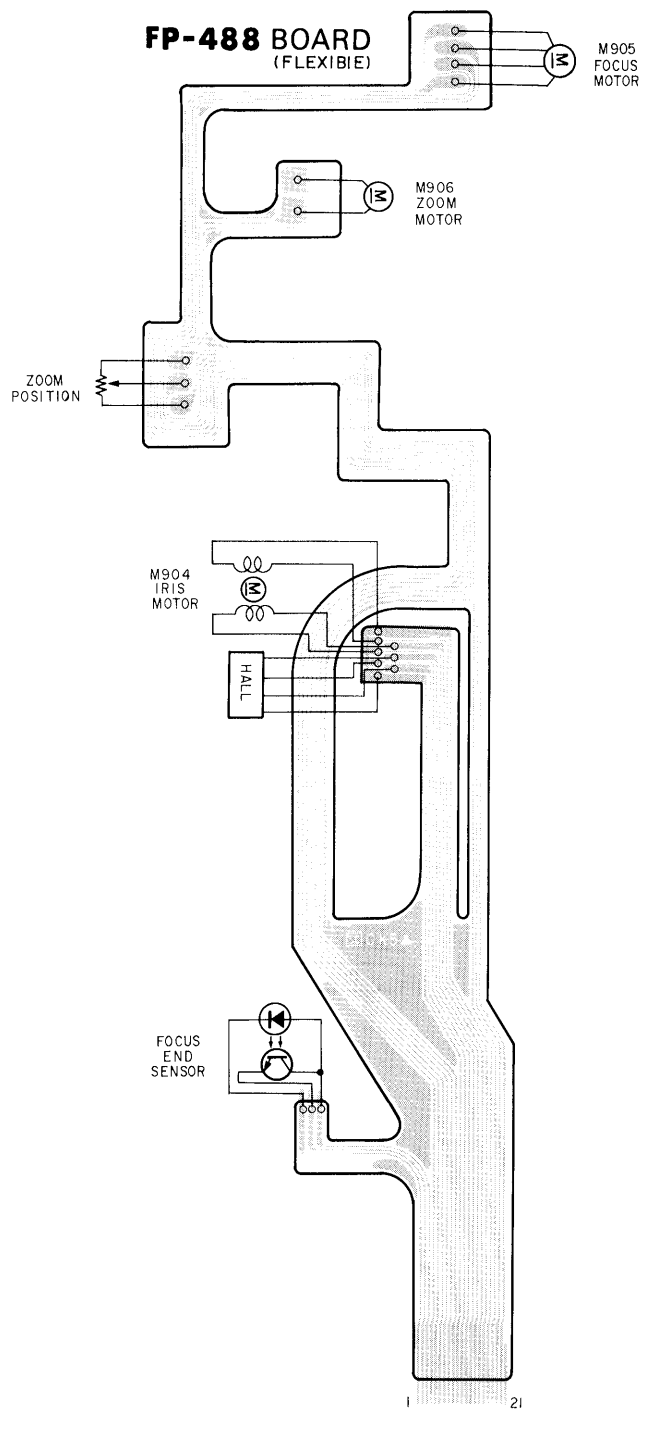
(IC)

IC001	8-752-033-38	IC	CXA1202R
IC501	8-759-058-96	IC	TB1206F
IC502	8-759-999-02	IC	TL1596CDB
IC503	8-752-836-46	IC	CXP80624-283Q
IC505	8-759-990-55	IC	CXA8006M
IC506	8-759-074-41	IC	uPD75316GF-246-3B9
IC507	8-759-511-22	IC	CXA1448N
IC508	8-759-512-69	IC	S-81350HG-KD
IC509	8-759-145-63	IC	uPD7564G-540
IC510	8-759-039-01	IC	MPC1720M
IC511	8-759-044-78	IC	AK6420F-SGX2060
IC701	8-759-031-58	IC	SC7SU04F
IC702	8-759-635-27	IC	M62352GP
IC703	8-759-069-29	IC	uPD6456GS-618-E2
IC704	8-752-348-92	IC	CXD2101AR
IC705	8-759-063-18	IC	CXD2103AR-T6
IC706	8-752-337-36	IC	CXD2104N
IC707	8-752-344-93	IC	CXD2100AQ
IC707	8-752-344-53	IC	CXD2100Q
IC709	8-752-836-09	IC	CXP80624-278Q
IC712	8-759-044-78	IC	AK6420F
IC801	8-752-337-34	IC	CXD1257R
IC802	8-752-056-39	IC	CXA1507BR
IC803	8-752-053-26	IC	CXA1399Q
IC804	8-752-327-48	IC	CXD1250N
IC805	8-752-054-61	IC	CXA1390AR
IC851	8-759-701-24	IC	NJM3414M
IC852	8-759-998-96	IC	LM324D
IC853	8-759-038-81	IC	MPC1724M
IC854	8-759-823-51	IC	LB1830M
IC855	8-759-998-98	IC	LM358D

(TRANSISTOR)

Q002	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q003	8-729-905-12	TRANSISTOR	DTA144EU
Q041	8-729-010-60	TRANSISTOR	MSA1586-BC
Q042	8-729-920-99	TRANSISTOR	DTA114EU
Q043	8-729-216-22	TRANSISTOR	2SA1162-G
Q501	8-729-907-00	TRANSISTOR	DTC114EU
Q502	8-729-402-78	TRANSISTOR	XN6401
Q503	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q505	8-729-010-60	TRANSISTOR	MSA1586-BC
Q507	8-729-905-12	TRANSISTOR	DTA144EU
Q509	8-729-822-84	TRANSISTOR	2SB1202FAST
Q510	8-729-402-81	TRANSISTOR	XN4501
Q511	8-729-402-81	TRANSISTOR	XN4501
Q702	8-729-402-84	TRANSISTOR	XN4601
Q703	8-729-010-60	TRANSISTOR	MSA1586-BC
Q704	8-729-010-60	TRANSISTOR	MSA1586-BC
Q707	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q708	8-729-920-99	TRANSISTOR	DTA114EU
Q709	8-729-905-61	TRANSISTOR	DTC124EU
Q801	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q802	8-729-403-27	TRANSISTOR	XN4401
Q851	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q853	8-729-403-27	TRANSISTOR	XN4401

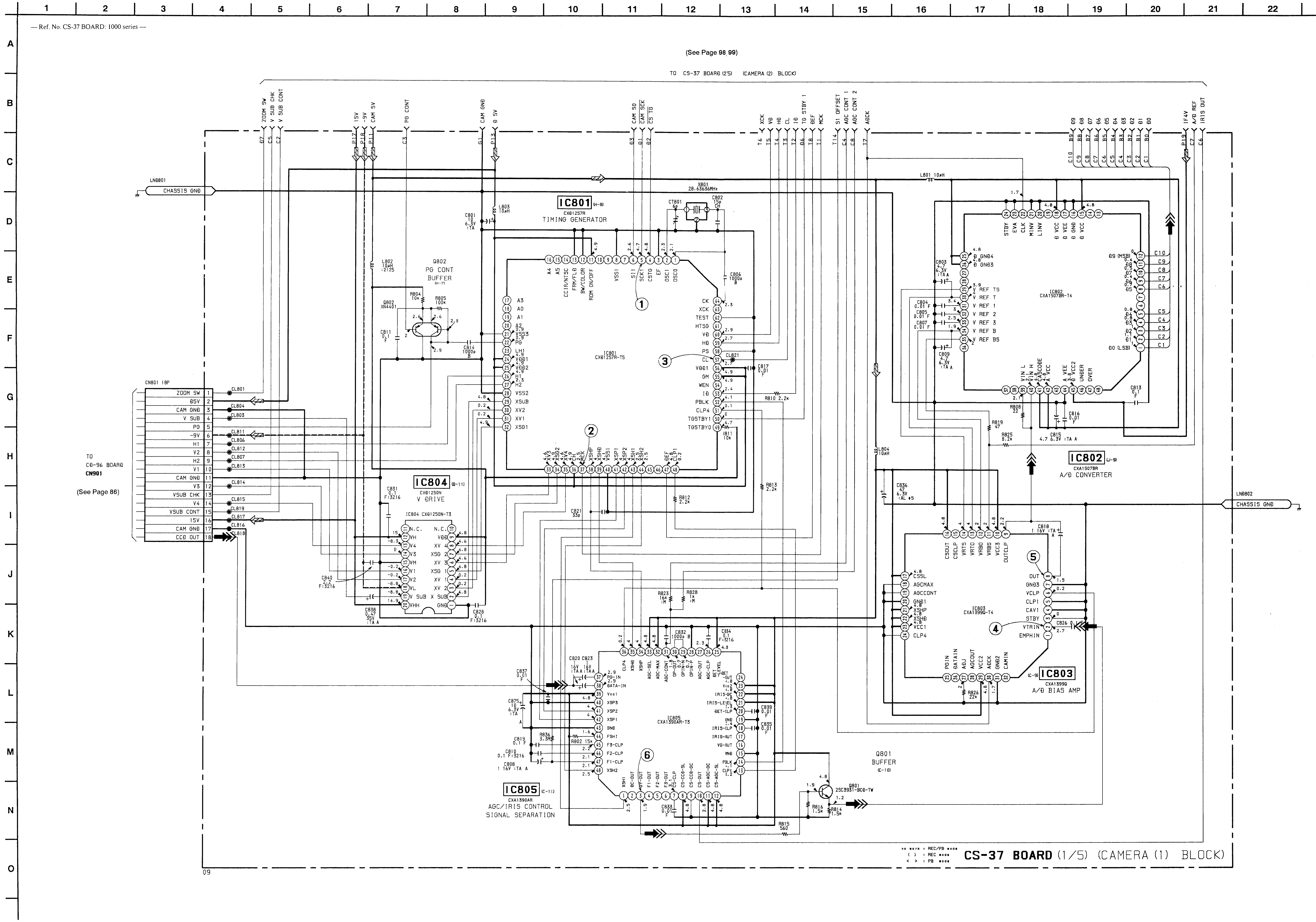

CS-37 BOARD (COMPONENT SIDE)
CS-37 BOARD (CONDUCTOR SIDE)
A
B
C
D
E
F
G
H
I
J
K
L
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
RESET
MODE CON
ST RCS
X801
28MHz
CAM
RP
FE
MECHA CON
LM DRIVER
1-644-458-11
CS-37
LANC
ATF BLOCK
D. DRIVER
MODE CON (BLOCK)
1-644-458-


FP-488 BOARD (FLEXIBLE)
M905 FOCUS MOTOR
M906 ZOOM MOTOR
ZOOM POSITION
M904 IRIS MOTOR
HALL
FOCUS END SENSOR

CS-37 (CAMERA) SCHEMATIC DIAGRAM

- Refer to page 89 for Printed Wiring Board.

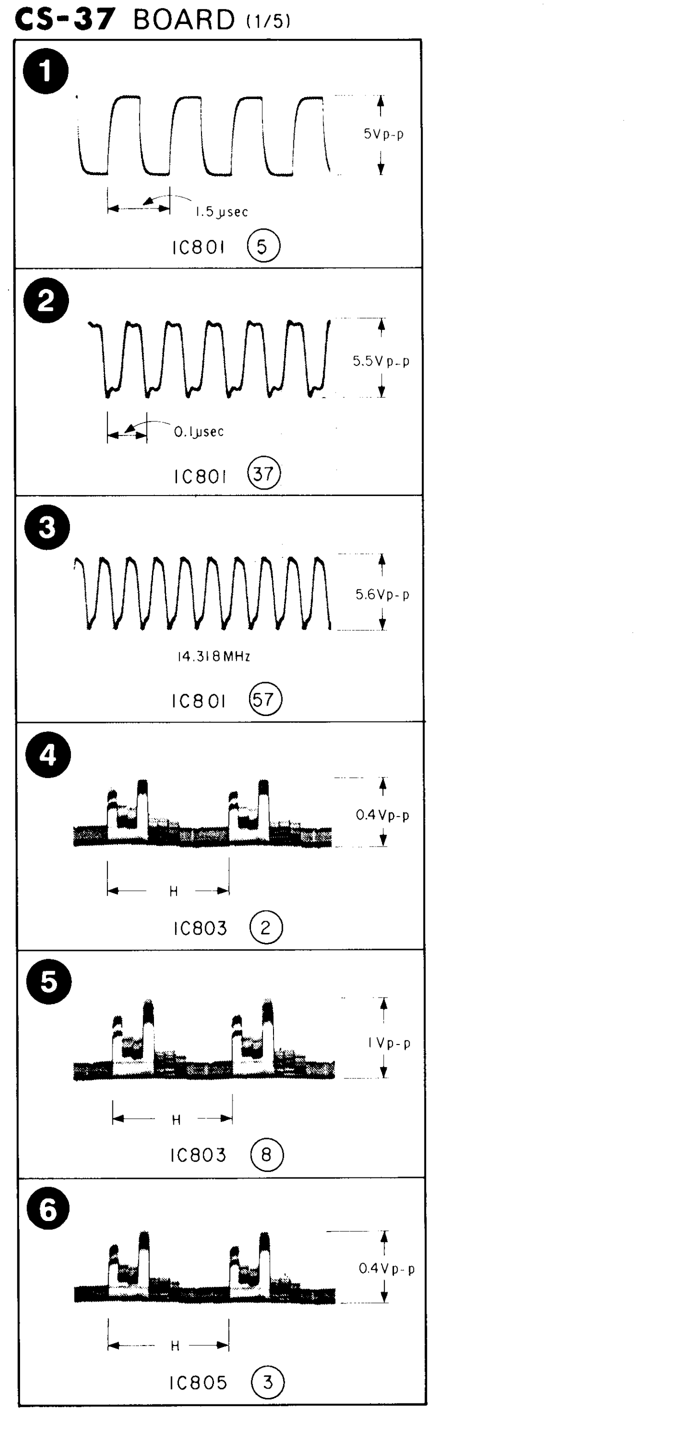
— Ref. No. CS-37 BOARD: 1000 series —


(See Page 98, 99)
TO CS-37 BOARD (2/5) (CAMERA (2) BLOCK)
IC801 CXD1257R TIMING GENERATOR
IC802 CXA1507BR A/D CONVERTER
IC803 CXA1399Q A/D BIAS AMP
IC804 CXD1250N V DRIVE
IC805 CXA1390AR AGC/IRIS CONTROL SIGNAL SEPARATION
Q801 BUFFER
Q802 PG CONT BUFFER
X801 28.63636MHz
LN801 CHASSIS GND
LN802 CHASSIS GND
CN801 18P
ZOOM SW
BSV
CAM GND
V SUB
PG
-9V
H1
V2
H2
V1
CAM GND
V3
VSUB CHK
V4
VSUB CONT
15V
CAM GND
CCD OUT
TO CD-96 BOARD CN901
(See Page 86)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
CS-37 BOARD (1/5) (CAMERA (1) BLOCK)

- SIGNAL PATH

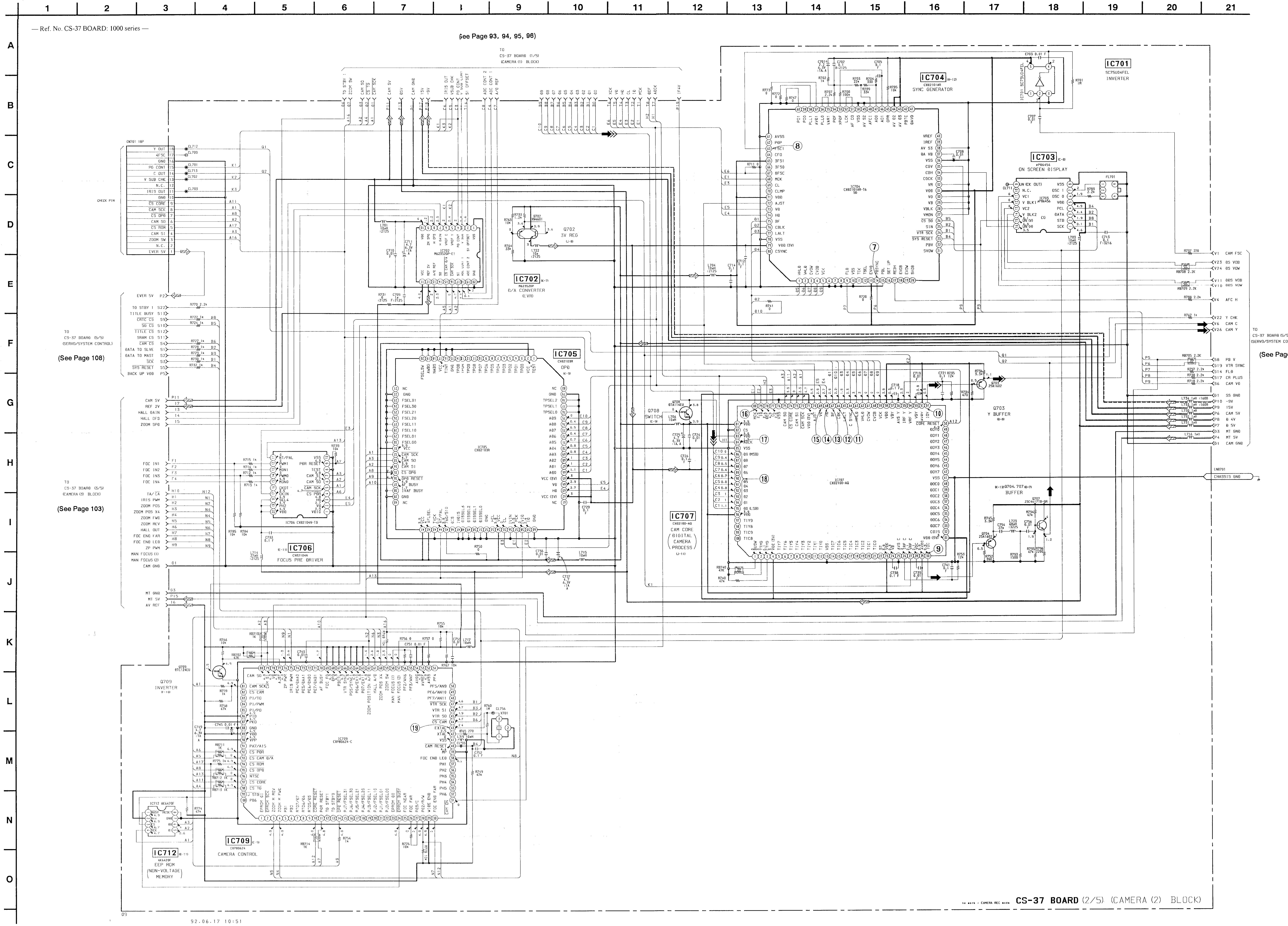
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡⋙	
PB				

CS-37 BOARD (1/5)



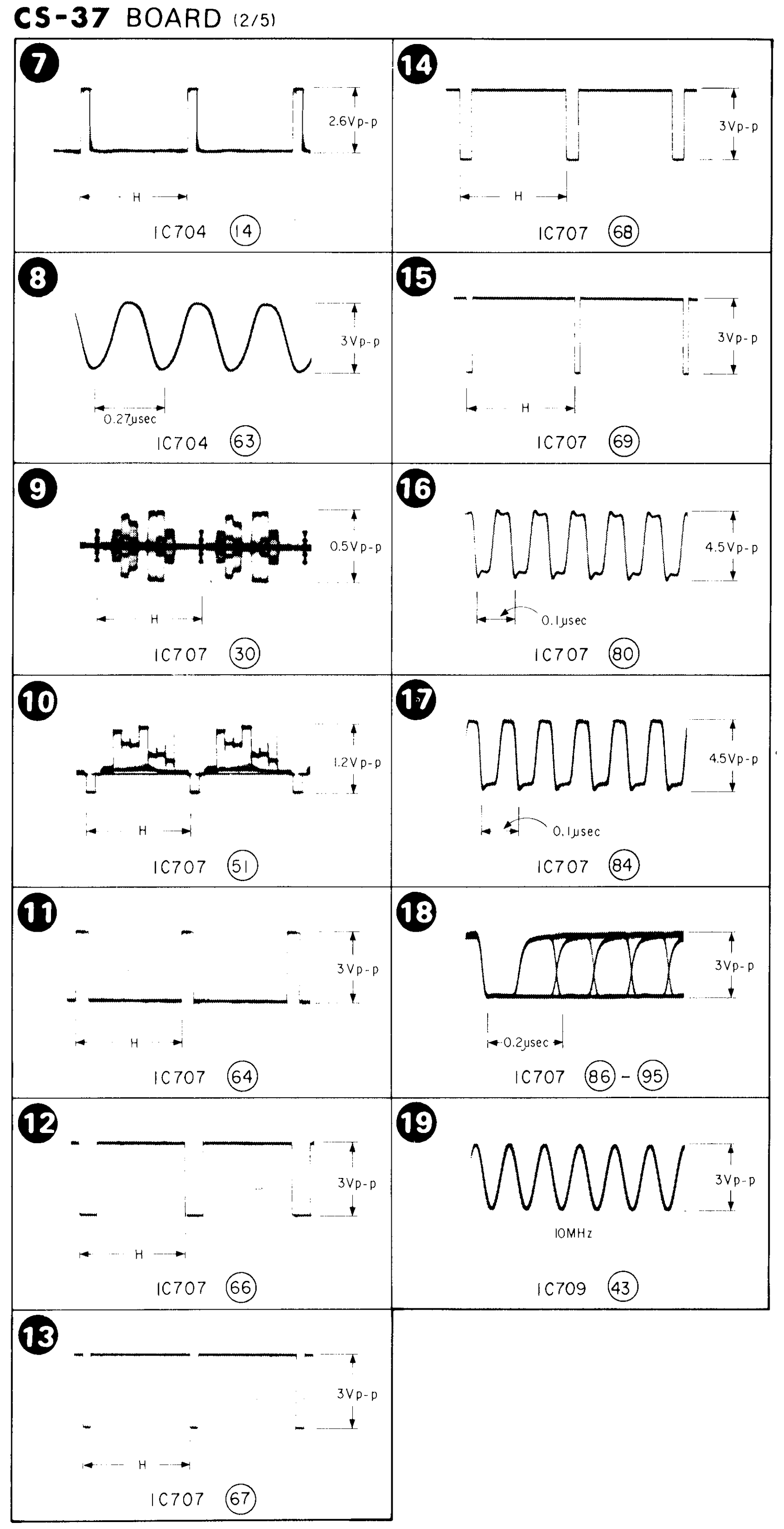
CS-37 (CAMERA) SCHEMATIC DIAGRAM

• Refer to page 89 for Printed Wiring Board.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
— Ref. No. CS-37 BOARD: 1000 series —
(See Page 93, 94, 95, 96)
TO CS-37 BOARD (1/5) (CAMERA (1) BLOCK)
CN701 18P
CHECK PIN
TO CS-37 BOARD (5/5) (SERVO/SYSTEM CONTROL)
(See Page 108)
TO CS-37 BOARD (5/5) (CAMERA (3) BLOCK)
(See Page 103)
IC701 SC75U04FEL INVERTER
IC702 M62352GP D/A CONVERTER
Q702 3V REG
IC703 ON SCREEN DISPLAY
IC704 CXD2101AR SYNC GENERATOR
IC705 CXD2103R OPD
IC706 CXD2104N FOCUS PRE DRIVER
IC707 CXD2100-AQ CAM CORE (DIGITAL CAMERA PROCESS)
Q708 SWITCH
Q703 Y BUFFER
Q704, 707 BUFFER
Q709 INVERTER
IC709 CXP80624 CAMERA CONTROL
IC712 AK6420F EEP ROM (NON-VOLTAGE) MEMORY
TO CS-37 BOARD (5/5) (SERVO/SYSTEM CO
(See Page
CS-37 BOARD (2/5) (CAMERA (2) BLOCK)
92.06.17 10:51

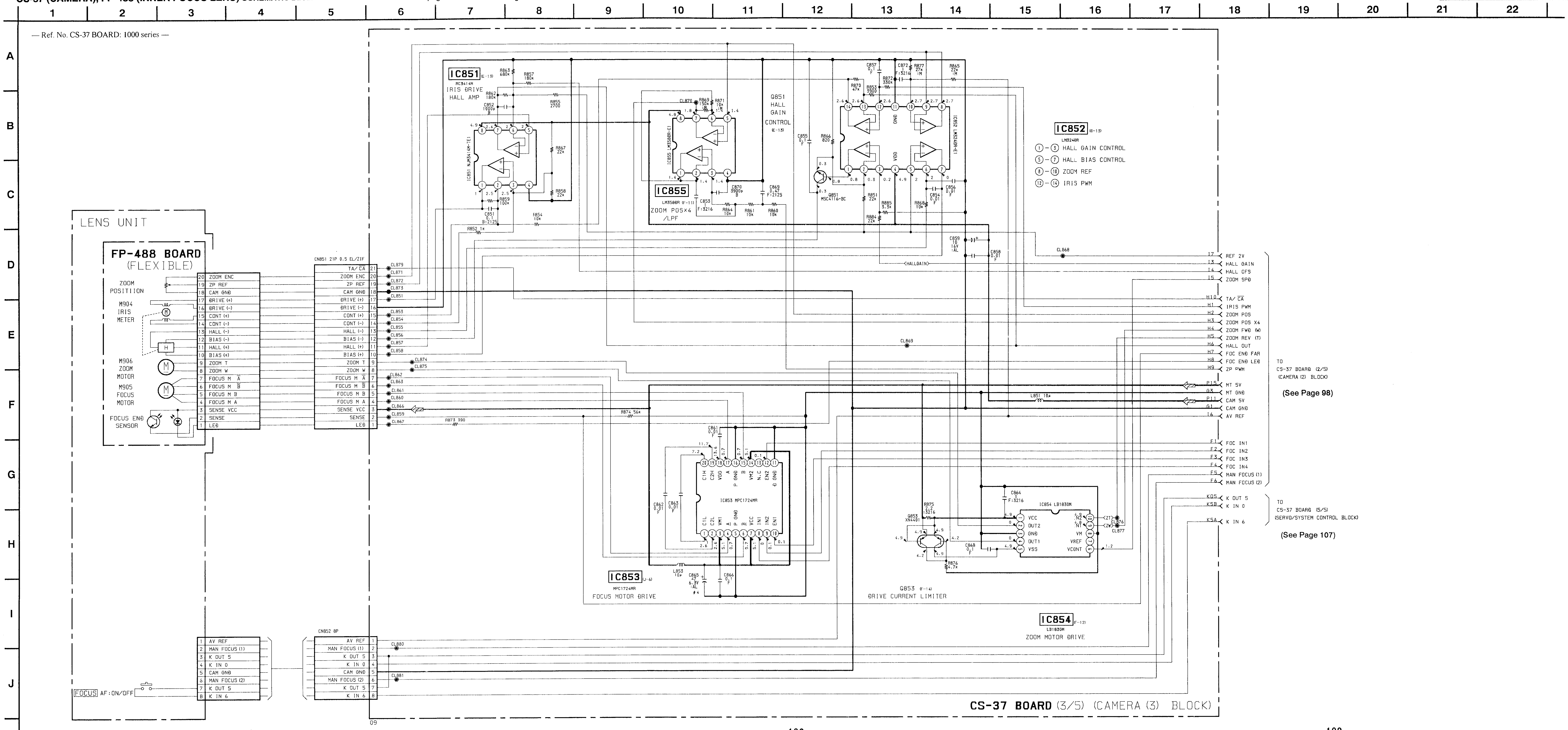
• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡≫≫	
PB				



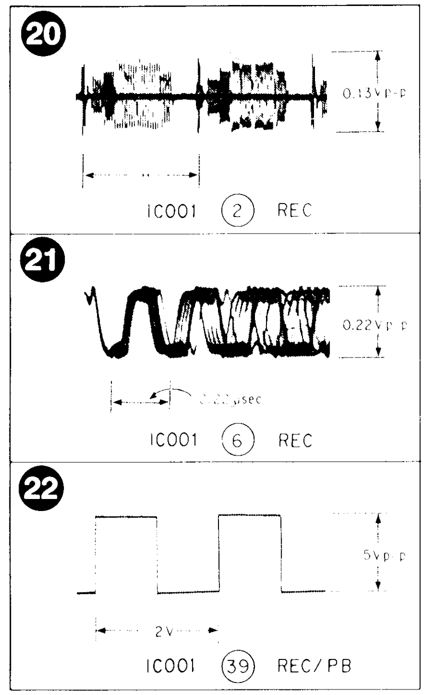
CS-37 (CAMERA), FP-488 (INNER FOCUS LENS) SCHEMATIC DIAGRAMS

• Refer to page 89 for Printed Wiring Board.



— Ref. No. CS-37 BOARD: 1000 series —
LENS UNIT
FP-488 BOARD
(FLEXIBLE)
ZOOM POSITION
M904 IRIS METER
M906 ZOOM MOTOR
M905 FOCUS MOTOR
FOCUS END SENSOR
CN851 21P 0.5 EL/ZIF
TA/CA
ZOOM ENC
ZP REF
CAM GND
DRIVE (+)
DRIVE (−)
CONT (+)
CONT (−)
HALL (−)
BIAS (−)
HALL (+)
BIAS (+)
ZOOM T
ZOOM W
FOCUS M A
FOCUS M B
SENSE VCC
SENSE
LED
IC851 IRIS DRIVE HALL AMP
IC855 ZOOM POS×4 /LPF
Q851 HALL GAIN CONTROL
IC852 LM3248R
①-③ HALL GAIN CONTROL
⑤-⑦ HALL BIAS CONTROL
⑧-⑩ ZOOM REF
⑫-⑭ IRIS PWM
IC853 MPC1724MR FOCUS MOTOR DRIVE
Q853 DRIVE CURRENT LIMITER
IC854 LB1830M ZOOM MOTOR DRIVE
REF 2V
HALL GAIN
HALL OFS
ZOOM SPD
IRIS PWM
ZOOM POS
ZOOM POS X4
ZOOM FWD (W)
ZOOM REV (T)
HALL OUT
FOC END FAR
FOC END LED
ZP PWM
MT 5V
MT GND
CAM 5V
CAM GND
AV REF
FOC IN1
FOC IN2
FOC IN3
FOC IN4
MAN FOCUS (1)
MAN FOCUS (2)
K OUT 5
K IN 0
K IN 6
TO CS-37 BOARD (2/5) (CAMERA (2) BLOCK)
(See Page 98)
TO CS-37 BOARD (5/5) (SERVO/SYSTEM CONTROL BLOCK)
(See Page 107)
CN852 8P
FOCUS AF:ON/OFF
CS-37 BOARD (3/5) (CAMERA (3) BLOCK)

CS-37 BOARD (4/5)



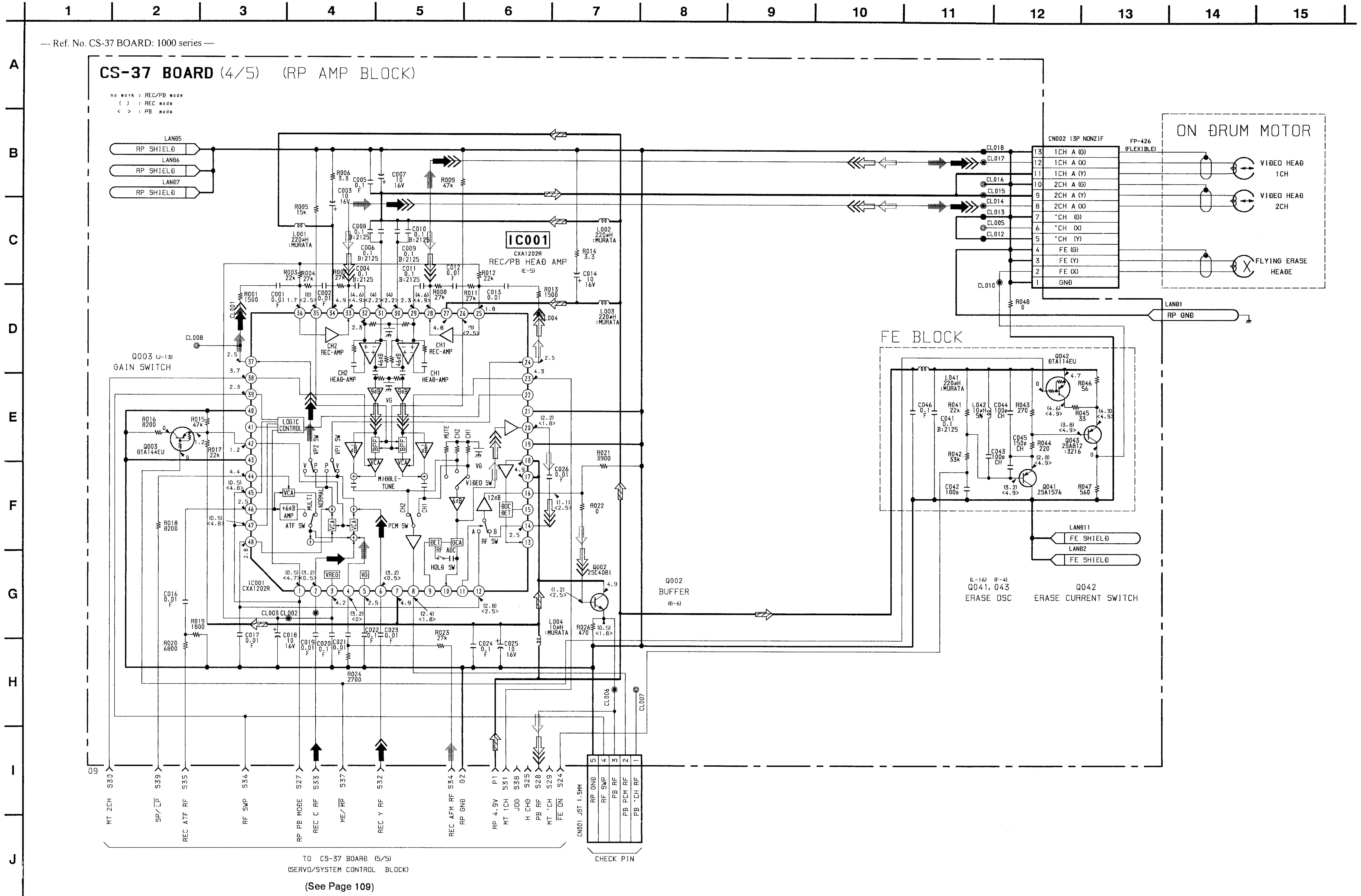
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡⋙	⇨
PB	⇨	⇨»	⇨⋙	⇨

CS-37 (REC/PB AMP) SCHEMATIC DIAGRAM

- Refer to page 89 for Printed Wiring Board.

— Ref. No. CS-37 BOARD: 1000 series —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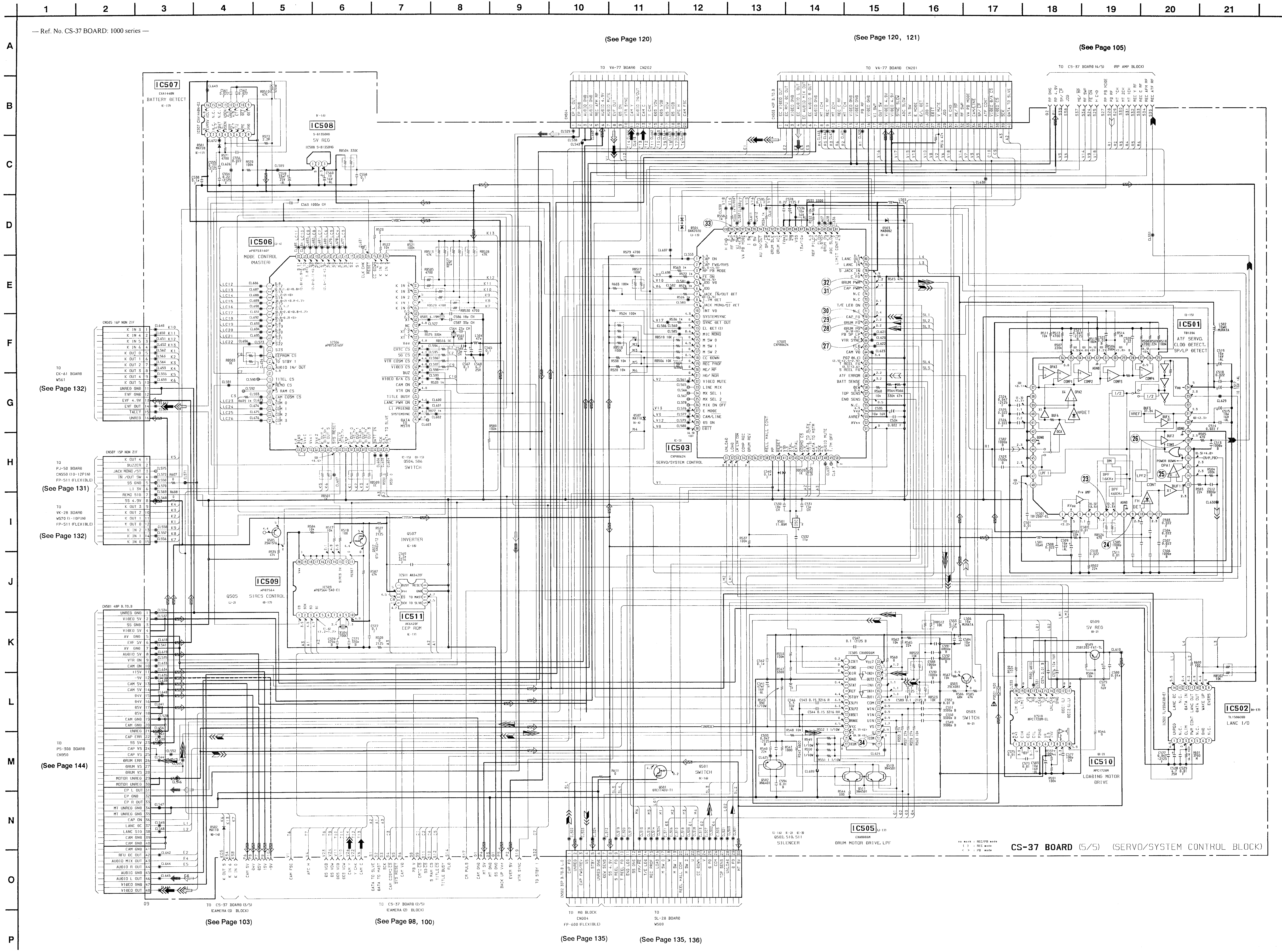
A
B
C
D
E
F
G
H
I
J
CS-37 BOARD (4/5) (RP AMP BLOCK)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
LAND5
RP SHIELD
LAND6
RP SHIELD
LAND7
RP SHIELD
IC001
CXA1202R
REC/PB HEAD AMP
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
LOGIC CONTROL
MIDDLE-TUNE
VIDEO SW
PCM SW
ATF SW
RF SW
HOLD SW
RF AGC
Q003 (J-13)
GAIN SWITCH
Q003
DTA144EU
Q002
2SC4081
Q002
BUFFER
(B-6)
ON DRUM MOTOR
CN002 13P NONZIF
FP-426
(FLEXIBLE)
13 1CH A (G)
12 1CH A (X)
11 1CH A (Y)
10 2CH A (G)
9 2CH A (Y)
8 2CH A (X)
7 'CH (G)
6 'CH (X)
5 'CH (Y)
4 FE (G)
3 FE (Y)
2 FE (X)
1 GND
VIDEO HEAD
1CH
VIDEO HEAD
2CH
FLYING ERASE
HEADE
LAND1
RP GND
FE BLOCK
Q042
DTA114EU
Q043
2SA812
Q041
2SA1576
LAND11
FE SHIELD
LAND12
FE SHIELD
(L-16) (F-4)
Q041, 043
ERASE OSC
Q042
ERASE CURRENT SWITCH
09
S30 MT 2CH
S39 SP/LP
S35 REC ATF RF
S36 RF SWP
S27 RP PB MODE
S33 REC C RF
S37 ME/MP
S32 REC Y RF
S34 REC AFM RF
G2 RP GND
P1 RP 4.9V
S31 MT 1CH
S38 JOG
S25 H CHG
S28 PB RF
S29 MT 'CH
S24 FE ON
CN001 JST 1.5MM
5 RP GND
4 RF SWP
3 PB RF
2 PB PCM RF
1 PB 'CH RF
CHECK PIN
TO CS-37 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)
(See Page 109)

CS-37 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

- Refer to page 89 for Printed Wiring Board.

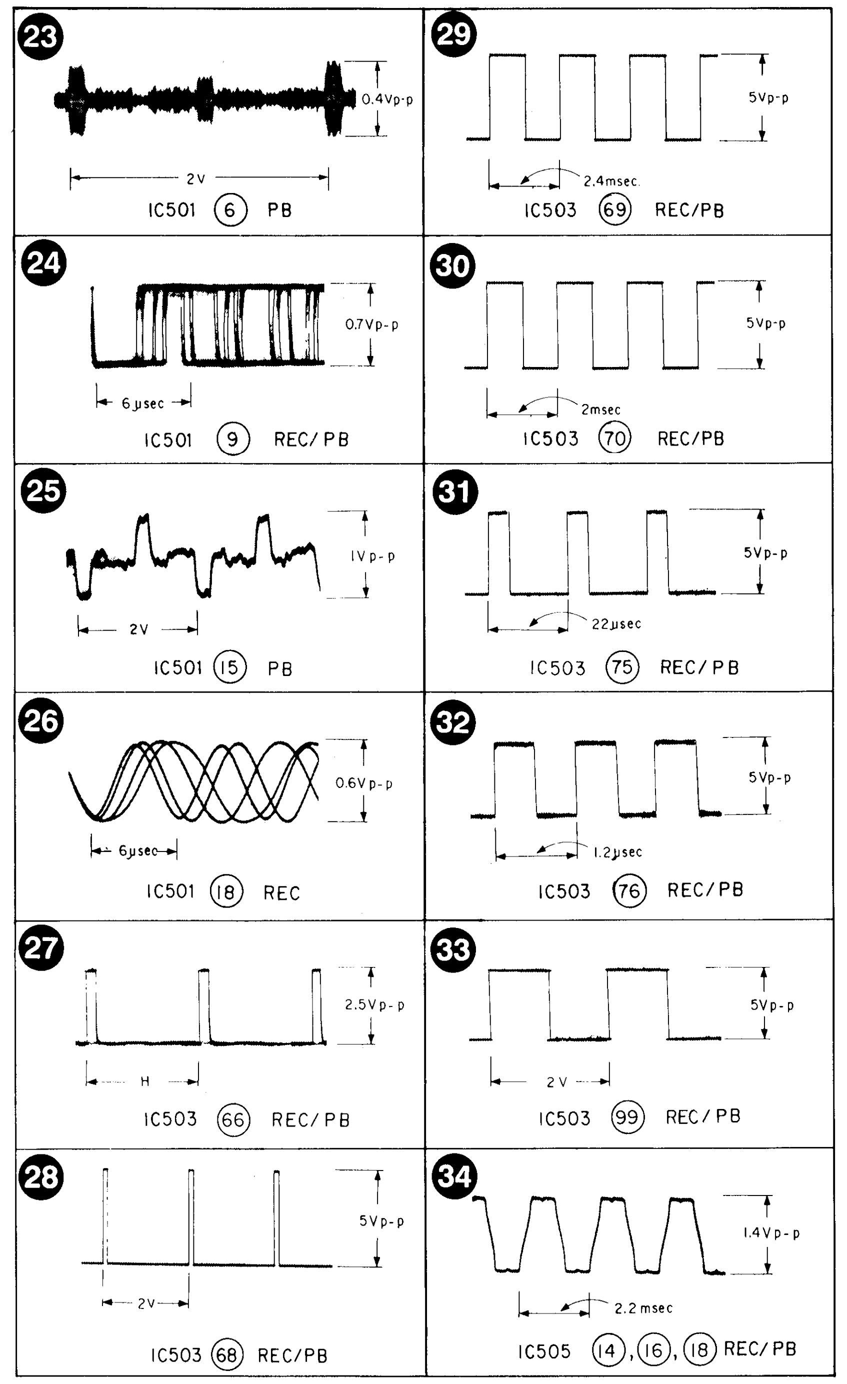

— Ref. No. CS-37 BOARD: 1000 series —
(See Page 120)
(See Page 120, 121)
(See Page 105)
TO VA-77 BOARD CN202
TO VA-77 BOARD CN201
TO CS-37 BOARD (4/5) (RP AMP BLOCK)
IC507
BATTERY DETECT
IC508
5V REG
IC506
MODE CONTROL (MASTER)
IC503
SERVO/SYSTEM CONTROL
IC501
ATF SERVO, CLOG DETECT, SP/LP DETECT
IC509
SIRCS CONTROL
Q505
Q507
INVERTER
IC511
EEP ROM
S504 S66
SWITCH
TO CK-41 BOARD W561
(See Page 132)
TO PJ-50 BOARD CN550 (10-12PIN) FP-511 (FLEXIBLE)
(See Page 131)
TO VK-28 BOARD W570 (1-10PIN) FP-511 (FLEXIBLE)
(See Page 132)
TO PS-500 BOARD CN950
(See Page 144)
TO CS-37 BOARD (3/5) (CAMERA (3) BLOCK)
(See Page 103)
TO CS-37 BOARD (2/5) (CAMERA (2) BLOCK)
(See Page 98, 100)
TO MD BLOCK CN004 FP-600 (FLEXIBLE)
(See Page 135)
TO SL-28 BOARD W500
(See Page 135, 136)
Q501
SWITCH
IC505
CXA8006M
DRUM MOTOR DRIVE, LPF
Q502, 510, 511
SILENCER
Q503
SWITCH
Q509
5V REG
IC510
MPC1720M
LOADING MOTOR DRIVE
IC502
LANC I/O
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
CS-37 BOARD (5/5) (SERVO/SYSTEM CONTROL BLOCK)

• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷»	
Drum servo (speed and phase)		▷»»	
Capstan speed servo			
Capstan phase servo	➤»	➤»»	⊃»
Capstan servo (speed and phase)		➤»	
Ref. signal	➤	➤	⊃

CS-37 BOARD (5/5)



VA-77 (VIDEO, AUDIO (MONO)) PRINTED WIRING BOARDS

— Ref. No. VA-77 BOARD: 2000 series —

〈 DIODE 〉

D102	8-719-800-76	DIODE	1SS226
D201	8-719-941-86	DIODE	DAN202U
D202	8-719-941-86	DIODE	DAN202U
D203	8-719-941-09	DIODE	DAP202U
D205	8-719-941-86	DIODE	DAN202U
D206	8-719-941-86	DIODE	DAN202U
D401	8-719-105-32	DIODE	RD2. 7M-B2

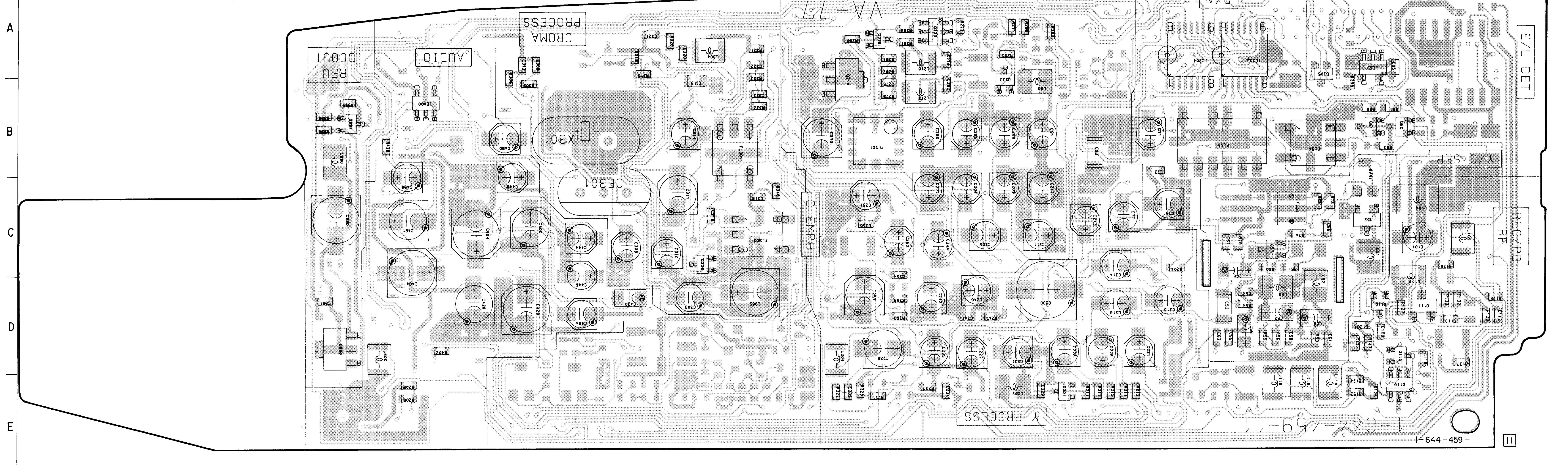
〈 IC 〉

IC051	8-752-332-68	IC	CXL5502M
IC052	8-759-710-29	IC	NJM2235M
IC053	8-759-031-84	IC	SC7S04F
IC054	8-752-053-21	IC	CXA1211M
IC201	8-752-036-19	IC	CXA1207AR
IC202	8-759-710-29	IC	NJM2235M
IC203	8-759-055-82	IC	M62353GP
IC204	8-759-055-82	IC	M62353GP
IC205	8-759-636-33	IC	CXA1452N
IC206	8-752-053-21	IC	CXA1211M
IC301	8-752-036-20	IC	CXA1208R
IC400	8-759-234-77	IC	TC4S66F
IC401	8-759-823-19	IC	CXA1488R

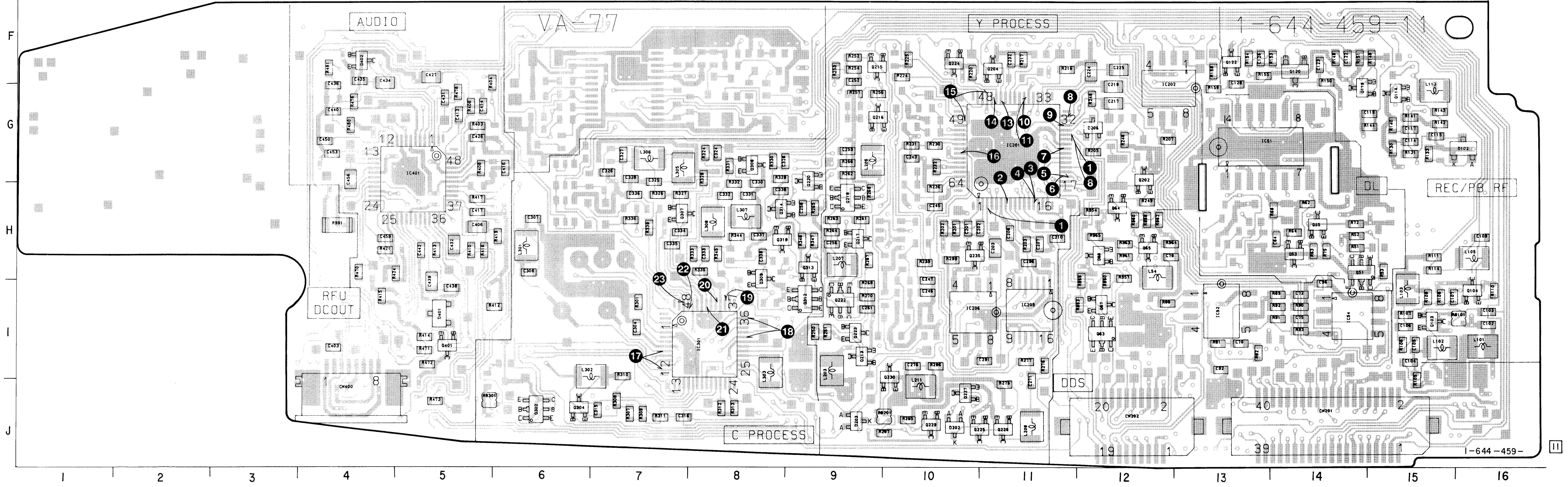
〈 TRANSISTOR 〉

Q051	8-729-920-48	TRANSISTOR	IMH2
Q052	8-729-141-48	TRANSISTOR	2SB624-BV345
Q053	8-729-010-60	TRANSISTOR	MSA1586-BC
Q055	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q057	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q060	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q061	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q063	8-729-422-54	TRANSISTOR	XN4215
Q064	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q065	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q066	8-729-010-60	TRANSISTOR	MSA1586-BC
Q067	8-729-905-96	TRANSISTOR	DTA114TU
Q103	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q104	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q110	8-729-920-99	TRANSISTOR	DTA114EU
Q111	8-729-102-07	TRANSISTOR	2SC2223-F13
Q114	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q115	8-729-905-12	TRANSISTOR	DTA144EU
Q118	8-729-920-48	TRANSISTOR	IMH2
Q119	8-729-905-23	TRANSISTOR	2SA1576-R
Q120	8-729-102-07	TRANSISTOR	2SC2223-F13
Q122	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q202	8-729-010-60	TRANSISTOR	MSA1586-BC
Q204	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q213	8-729-905-18	TRANSISTOR	DTC144EU
Q214	8-729-106-60	TRANSISTOR	2SB1115A-YG
Q215	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q216	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q217	8-729-905-12	TRANSISTOR	DTA144EU
Q218	8-729-402-81	TRANSISTOR	XN4501
Q220	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q222	8-729-402-81	TRANSISTOR	XN4501
Q223	8-729-905-12	TRANSISTOR	DTA144EU
Q224	8-729-905-18	TRANSISTOR	DTC144EU
Q225	8-729-905-18	TRANSISTOR	DTC144EU
Q226	8-729-823-16	TRANSISTOR	2SC4555-5. 6. 7
Q227	8-729-905-18	TRANSISTOR	DTC144EU
Q228	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q229	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q230	8-729-010-60	TRANSISTOR	MSA1586-BC
Q232	8-729-010-60	TRANSISTOR	MSA1586-BC
Q233	8-729-925-42	TRANSISTOR	IMT2
Q235	8-729-010-60	TRANSISTOR	MSA1586-BC
Q302	8-729-402-81	TRANSISTOR	XN4501
Q304	8-729-905-12	TRANSISTOR	DTA144EU
Q306	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q307	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q308	8-729-010-60	TRANSISTOR	MSA1586-BC
Q309	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q312	8-729-420-20	TRANSISTOR	XN4312
Q313	8-729-905-12	TRANSISTOR	DTA144EU
Q314	8-729-010-75	TRANSISTOR	MSC4116-B/C
Q318	8-729-905-18	TRANSISTOR	DTC144EU
Q401	8-729-921-08	TRANSISTOR	DTC144TU
Q402	8-729-905-18	TRANSISTOR	DTC144EU
Q990	8-729-106-60	TRANSISTOR	2SB1115A-YQ
Q991	8-729-010-75	TRANSISTOR	MSC4116-B/C

VA-77 BOARD (COMPONENT SIDE)



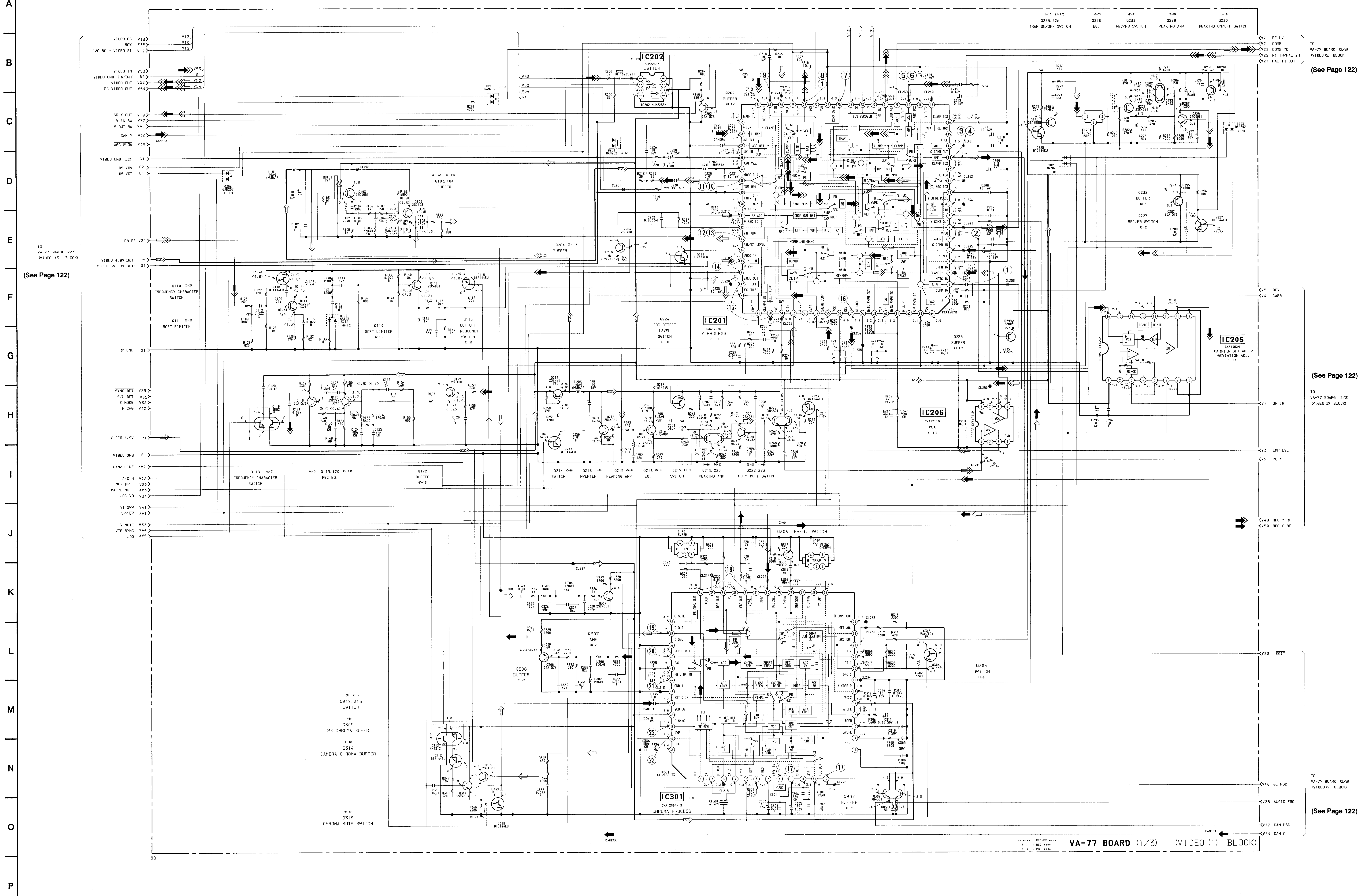
VA-77 BOARD (CONDUCTOR SIDE)



VA-77 (VIDEO) SCHEMATIC DIAGRAM

- Refer to page 111 for Printed Wiring Board.

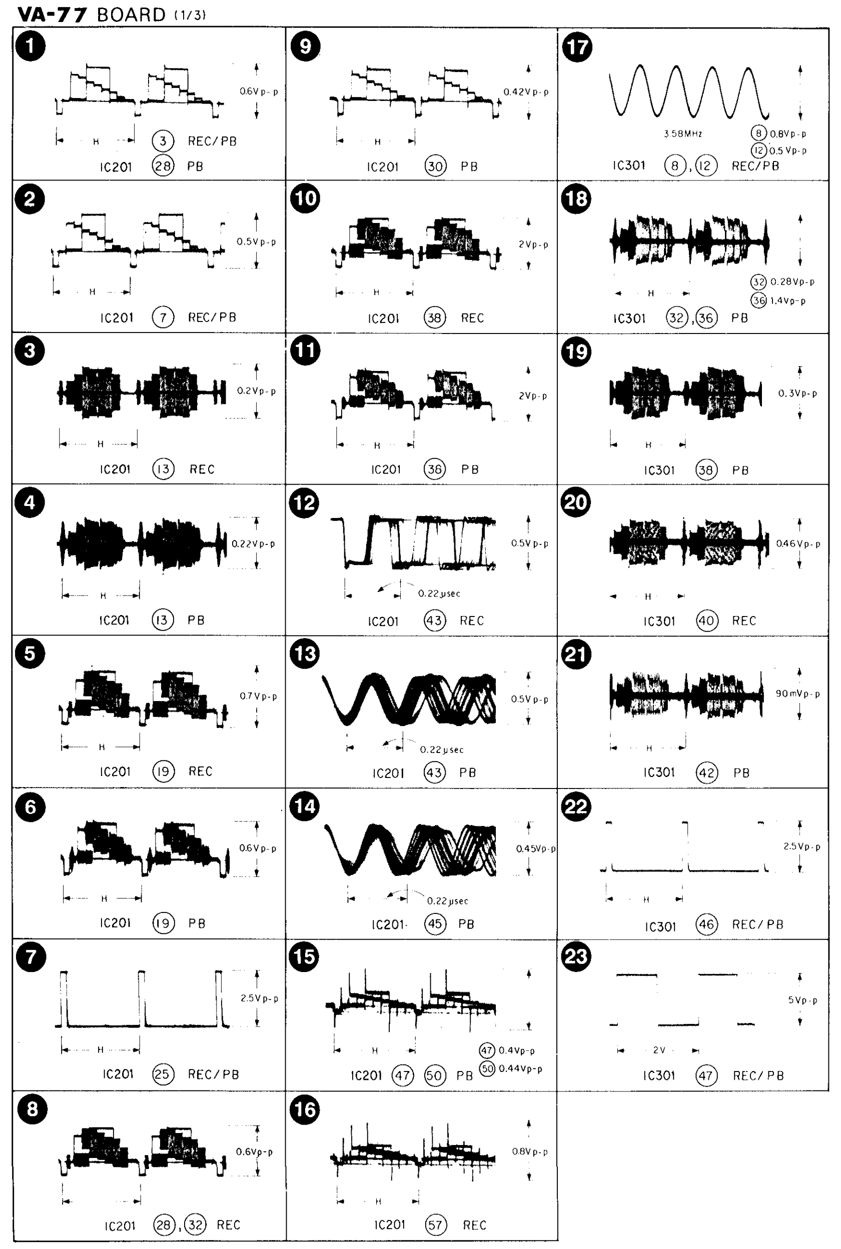
— Ref. No. VA-77 BOARD: 2000 series —


IC201
CXA1207M
Y PROCESS
IC202
NJM2235M
SWITCH
IC205
CXA1452M
CARRIER SET ADJ./DEVIATION ADJ.
IC206
CXA1211M
VCA
IC301
CXA1208R-13
CHROMA PROCESS
Q103, 104
BUFFER
Q110
FREQUENCY CHARACTER SWITCH
Q111
SOFT RIMITER
Q114
SOFT LIMITER
Q115
CUT-OFF FREQUENCY SWITCH
Q118
FREQUENCY CHARACTER SWITCH
Q119, 120
REC EQ.
Q122
BUFFER
Q202
BUFFER
Q204
BUFFER
Q224
DOC DETECT LEVEL SWITCH
Q214
SWITCH
Q213
INVERTER
Q215
PEAKING AMP
Q216
EQ.
Q217
SWITCH
Q218, 220
PEAKING AMP
Q222, 223
PB Y MUTE SWITCH
Q225, 226
TRAP ON/OFF SWITCH
Q228
EQ.
Q233
REC/PB SWITCH
Q229
PEAKING AMP
Q230
PEAKING ON/OFF SWITCH
Q232
BUFFER
Q227
REC/PB SWITCH
Q235
BUFFER
Q306
FREQ. SWITCH
Q307
AMP
Q308
BUFFER
Q304
SWITCH
Q302
BUFFER
Q312, 313
SWITCH
Q309
PB CHROMA BUFFER
Q314
CAMERA CHROMA BUFFER
Q318
CHROMA MUTE SWITCH
TO VA-77 BOARD (2/3) (VIDEO (2) BLOCK)
(See Page 122)
VIDEO CS V13
SCK V10
I/O SO • VIDEO SI V12
VIDEO IN V53
VIDEO GND (IN/OUT) G1
VIDEO OUT V52
EC VIDEO OUT V54
SR Y OUT V19
V IN 5V V37
V OUT 5V V40
CAM Y V20
AGC SLOW V38
VIDEO GND (EC) G1
DS VDW O2
DS VDD O1
PB RF V31
VIDEO 4.9V (OUT) P2
VIDEO GND (V OUT) G1
RP GND G1
SYNC DET V39
E/E DET V35
E MODE V36
H CHG V42
VIDEO 4.9V P1
VIDEO GND G1
CAM/LINE AV6
AFC H V26
ML/MP V30
VA PB MODE AV3
JOG VB V34
VI SWP V41
SP/LP AV1
V MUTE V32
VTR SYNC V44
JOG AV5
V7 EE LVL
V2 COMB
V23 COMB YC
V22 NT 1H/PAL 2H
V21 PAL 1H OUT
V5 DEV
V4 CARR
V1 SR IR
V3 EMP LVL
V9 PB Y
V49 REC Y RF
V50 REC C RF
V33 EBIT
V18 DL FSC
V25 AUDIO FSC
V27 CAM FSC
V24 CAM C
CAMERA
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
VA-77 BOARD (1/3) (VIDEO (1) BLOCK)

- SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡⋙	
PB	⇨	⇨≫	⇨⋙	

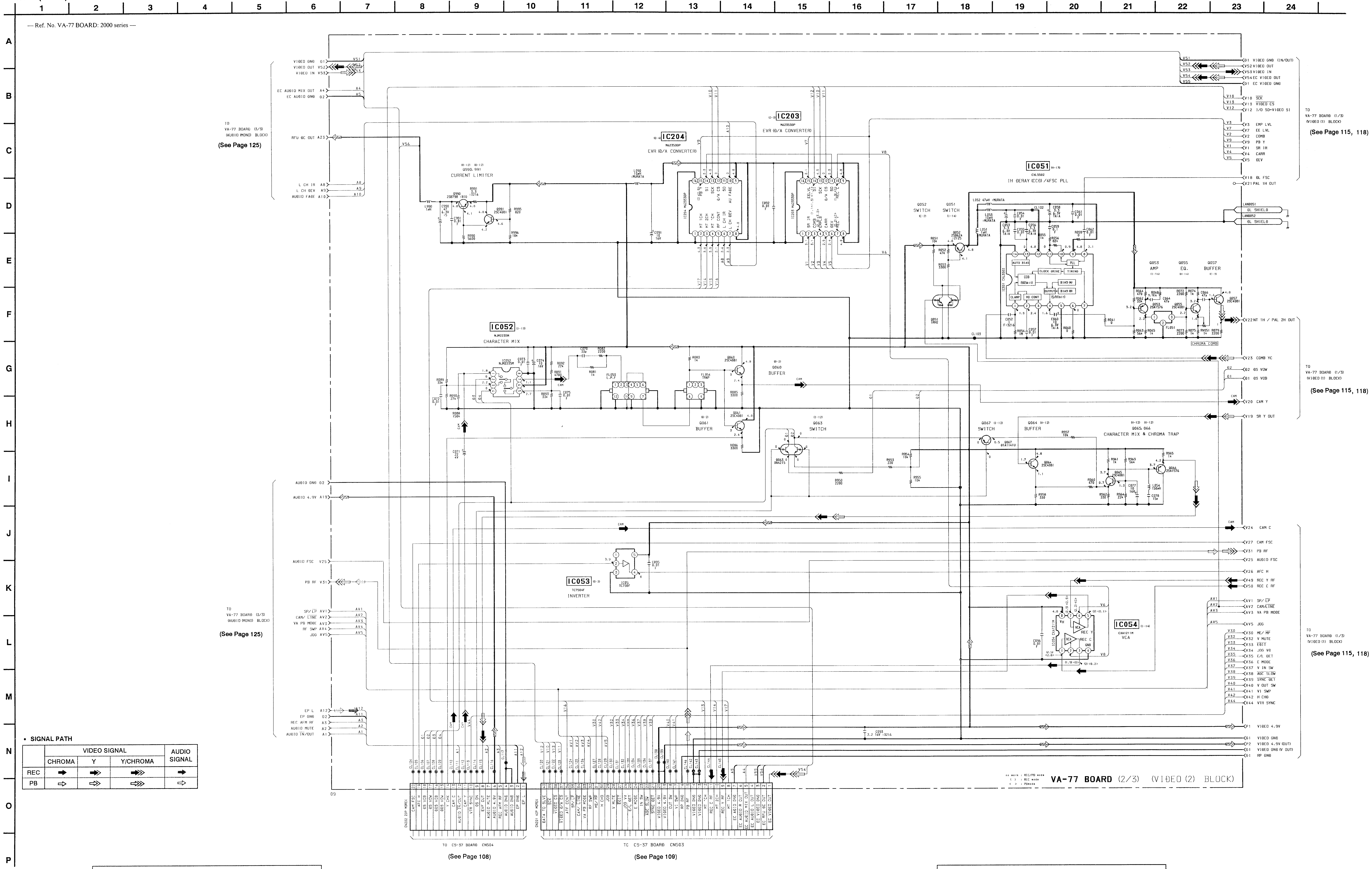
VA-77 BOARD (1/3)



VA-77 (VIDEO) SCHEMATIC DIAGRAM

• Refer to page 111 for Printed Wiring Board.

— Ref. No. VA-77 BOARD: 2000 series —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C
D
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I
J
K
L
M
N
O
P
TO VA-77 BOARD (3/3) (AUDIO (MONO) BLOCK)
(See Page 125)
VIDEO GND G1
VIDEO OUT V52
VIDEO IN V53
EC AUDIO MIX OUT A4
EC AUDIO GND G2
RFU DC OUT A23
L CH IR A8
L CH BEV A9
AUDIO FADE A10
Q990, 991 CURRENT LIMITER
IC204 M62358P EVR (D/A CONVERTER)
IC203 M62358P EVR (D/A CONVERTER)
IC051 CXL5502 1H DELAY (CCD) / 4FSC PLL
Q052 SWITCH
Q051 SWITCH
Q053 AMP
Q055 EQ.
Q057 BUFFER
CHROMA COMB
IC052 NJM2235M CHARACTER MIX
Q060 BUFFER
Q061 BUFFER
Q063 SWITCH
Q067 SWITCH
Q064 BUFFER
Q065, 066 CHARACTER MIX & CHROMA TRAP
IC053 TC7S04F INVERTER
IC054 CXA1211M VCA
AUDIO GND G2
AUDIO 4.9V A19
AUDIO FSC V25
PB RF V31
SP/LP AV1
CAM/LINE AV2
VA PB MODE AV3
RF SWP AV4
JOG AV5
EP L A12
EP GND G2
REC AFM RF A3
AUDIO MUTE A2
AUDIO IN/OUT A1
TO VA-77 BOARD (1/3) (VIDEO (1) BLOCK)
(See Page 115, 118)
V1 VIDEO GND (IN/OUT)
V52 VIDEO OUT
V53 VIDEO IN
V54 EC VIDEO OUT
G1 EC VIDEO GND
V10 SCK
V13 VIDEO CS
V12 I/O SO→VIDEO SI
V3 EMP LVL
V7 EE LVL
V2 COMB
V9 PB Y
V1 SR IR
V4 CARR
V5 BEV
V18 BL FSC
V21 PAL 1H OUT
GL SHIELD
V22 NT 1H / PAL 2H OUT
V23 COMB YC
G2 OS VDW
G1 OS VDB
V20 CAM Y
V19 SR Y OUT
V24 CAM C
V27 CAM FSC
V31 PB RF
V25 AUDIO FSC
V26 AFC H
V49 REC Y RF
V50 REC C RF
AV1 SP/LP
AV2 CAM/LINE
AV3 VA PB MODE
AV5 JOG
V30 ME/MF
V32 V MUTE
V33 EDIT
V34 JOG VD
V35 E/L DET
V36 E MODE
V37 V IN SW
V38 AGC SLOW
V39 SYNC DET
V40 V OUT SW
V41 V1 SWP
V42 H CHG
V44 VTR SYNC
P1 VIDEO 4.9V
G1 VIDEO GND
P2 VIDEO 4.9V (OUT)
G1 VIDEO GND (V OUT)
G1 RF GND
TO CS-37 BOARD CN504
(See Page 108)
TO CS-37 BOARD CN503
(See Page 109)
VA-77 BOARD (2/3) (VIDEO (2) BLOCK)

• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨

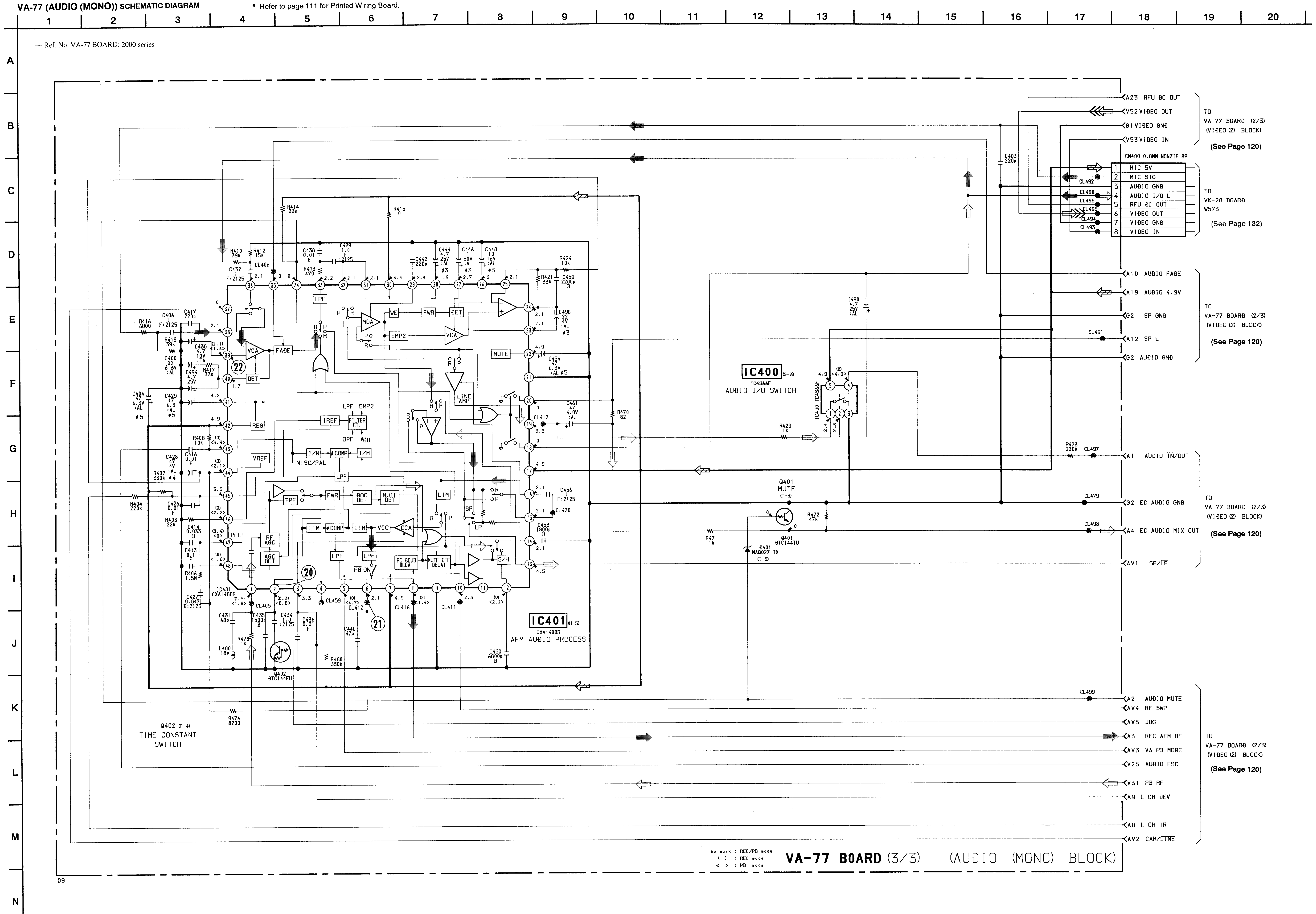
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	➡
PB			⇨≫	⇨

VA-77 (AUDIO (MONO)) SCHEMATIC DIAGRAM

- Refer to page 111 for Printed Wiring Board.

— Ref. No. VA-77 BOARD: 2000 series —


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
A B C D E F G H I J K L M N
A23 RFU DC OUT
V52 VIDEO OUT
G1 VIDEO GND
V53 VIDEO IN
TO VA-77 BOARD (2/3) (VIDEO (2) BLOCK)
(See Page 120)
CN400 0.8MM NONZIF 8P
1 MIC 5V
2 MIC SIG
3 AUDIO GND
4 AUDIO I/O L
5 RFU DC OUT
6 VIDEO OUT
7 VIDEO GND
8 VIDEO IN
CL492 CL490 CL496 CL495 CL494 CL493
TO VK-28 BOARD W573
(See Page 132)
A10 AUDIO FADE
A19 AUDIO 4.9V
G2 EP GND
A12 EP L
G2 AUDIO GND
CL491
TO VA-77 BOARD (2/3) (VIDEO (2) BLOCK)
(See Page 120)
A1 AUDIO IN/OUT
G2 EC AUDIO GND
A4 EC AUDIO MIX OUT
AV1 SP/LP
R473 220k CL497 CL479 CL498
TO VA-77 BOARD (2/3) (VIDEO (2) BLOCK)
(See Page 120)
A2 AUDIO MUTE
AV4 RF SWP
AV5 JOG
A3 REC AFM RF
AV3 VA PB MODE
V25 AUDIO FSC
V31 PB RF
A9 L CH DEV
A8 L CH IR
AV2 CAM/LINE
CL499
TO VA-77 BOARD (2/3) (VIDEO (2) BLOCK)
(See Page 120)
IC400 (G-3) TC4S66F AUDIO I/O SWITCH
IC400 TC4S66F
C490 4.7 25V :AL
R429 1k
Q401 MUTE (I-5)
Q401 DTC144TU
D401 MA8027-TX (I-5)
R471 1k
R472 47k
C403 220p
IC401 (H-5) CXA1488R AFM AUDIO PROCESS
IC401 CXA1488R
Q402 (F-4) TIME CONSTANT SWITCH
Q402 DTC144EU
R476 8200
R478 1k
R480 330k
L400 18µ
C431 68p
C435 1500p B
C434 1.0 :2125
C436 0.01 F
C440 47p
C450 6800p B
C453 1800p B
C456 1 F:2125
C461 47 4.0V :AL
R470 82
C454 47 6.3V :AL #5
C498 22 4V :AL #3
C459 2200p B
R424 10k
R421 33k
R414 33k
R415 0
R410 39k
R412 15k
C432 1 F:2125
C438 0.01 B
C439 1.0 F :2125
R413 470
C442 220p
C444 4.7 25V :AL #3
C446 1 50V :AL #3
C448 10 16V :AL #3
R416 6800
C406 F:2125
C417 220p
R419 39k
C430 4.7 10V :TA
C400 22 6.3V :AL
C494 4.7 25V
R417 33k
C464 47 6.3V :AL #5
C429 47 6.3 :AL #5
R408 10k
C428 47 4V :AL
C416 0.01 F
R402 330k #4
R404 220k
C426 0.01 F
R403 22k
C414 0.033 B
C413 0.1 F
R406 1.5M
C427 0.047 B:2125
CL405 CL459 CL412 CL416 CL411 CL406 CL417 CL420
VCA FADE DET REG VREF IREF FILTER CTL LPF EMP2 BPF VDD
I/N COMP I/M NTSC/PAL LPF
BPF FWR DOC DET MUTE DET
RF AGC AGC DET PLL
LIM COMP LIM VCO CCA LPF LPF PB ON
PC DOUB DELAT MUTE OFF DELAT S/H
LIM SP LP
LPF MOA WE FWR DET VCA EMP2 MUTE LINE AMP
20 21 22
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
VA-77 BOARD (3/3) (AUDIO (MONO) BLOCK)
09

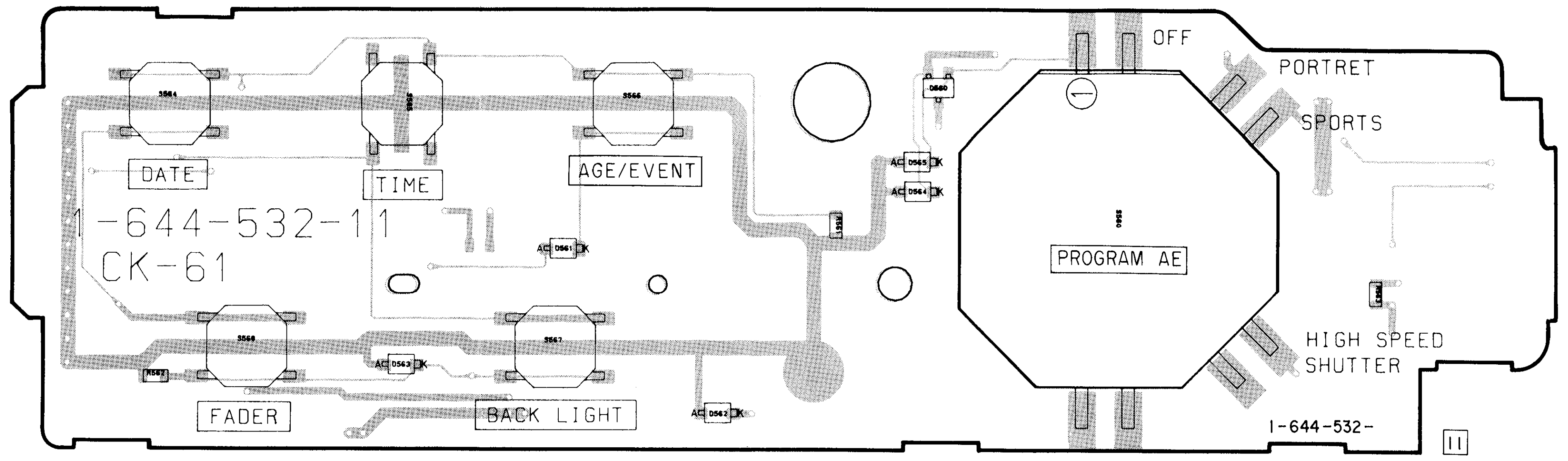
MA-155 (MIC AMP), VK-28 (VTR CONTROL SWITCH), FL-53 (PUSH FOCUS HOLD SWITCH), SW-206 (CAMERA START/STOP), CK-61 (CAMERA CONTROL SWITCH), DK-24 (RESET SWITCH), PK-35 (CAMERA/PLAYER SWITCH), PL-50 (VIDEO/AUDIO OUT) PRINTED WIRING BOARDS

— Ref. No. MA-155 BOARD: 3000 series, VK-28, FL-53 BOARDS: 4000 series, SW-206 BOARD: 5000 series, CK-61 BOARD: 6000 series, DK-24 BOARD: 7000 series, PK-35 BOARD: 8000 series, PL-50 BOARD: 9000 series —

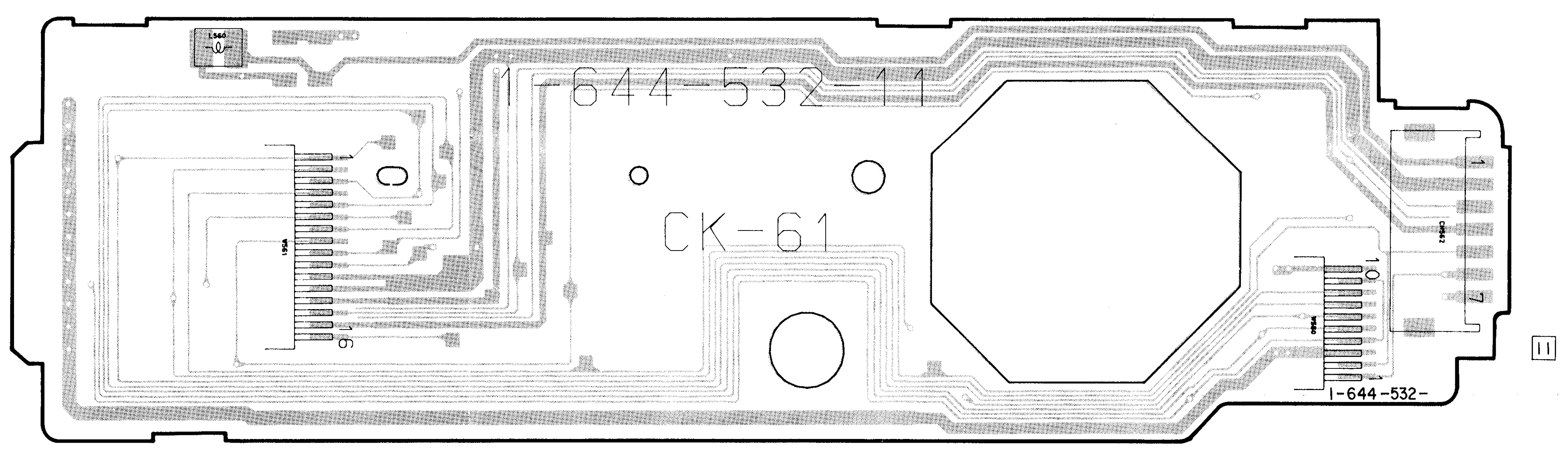
(DIODE)

D560	8-719-820-05	DIODE	1SS181
D561	8-719-404-46	DIODE	MA110
D562	8-719-110-03	DIODE	RD7. 5ES-B2
D563	8-719-110-03	DIODE	RD7. 5ES-B2
D564	8-719-110-03	DIODE	RD7. 5ES-B2
D565	8-719-110-03	DIODE	RD7. 5ES-B2

CK-61 BOARD (COMPONENT SIDE)


OFF
PORTRET
SPORTS
DATE
TIME
AGE/EVENT
1-644-532-11
CK-61
PROGRAM AE
HIGH SPEED SHUTTER
FADER
BACK LIGHT
1-644-532-

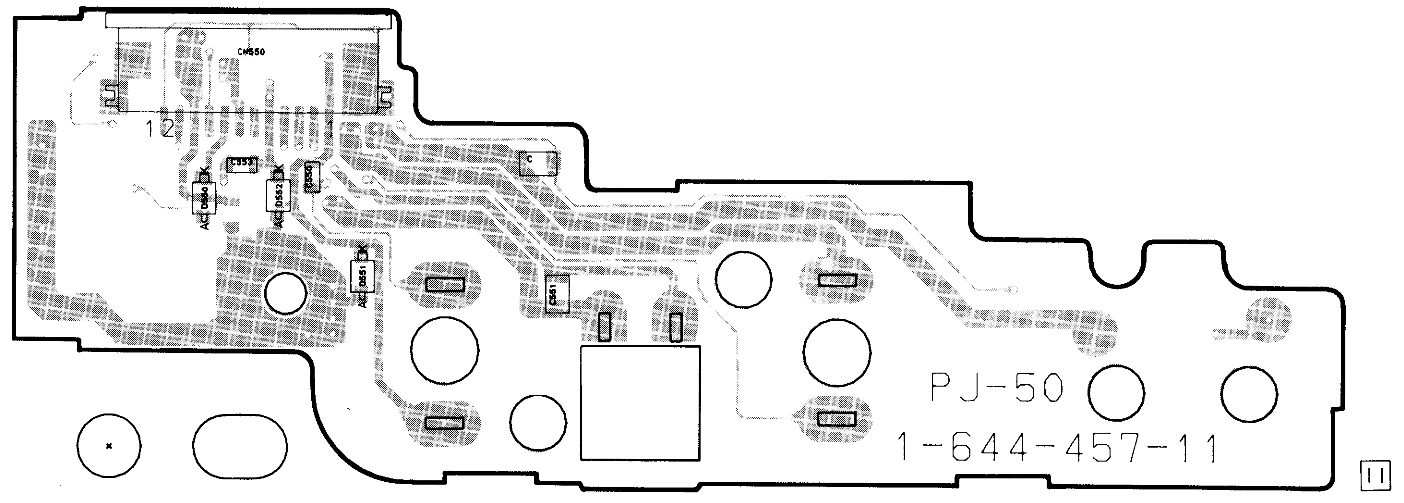
CK-61 BOARD (CONDUCTOR SIDE)


1-644-532-11
CK-61
1-644-532-

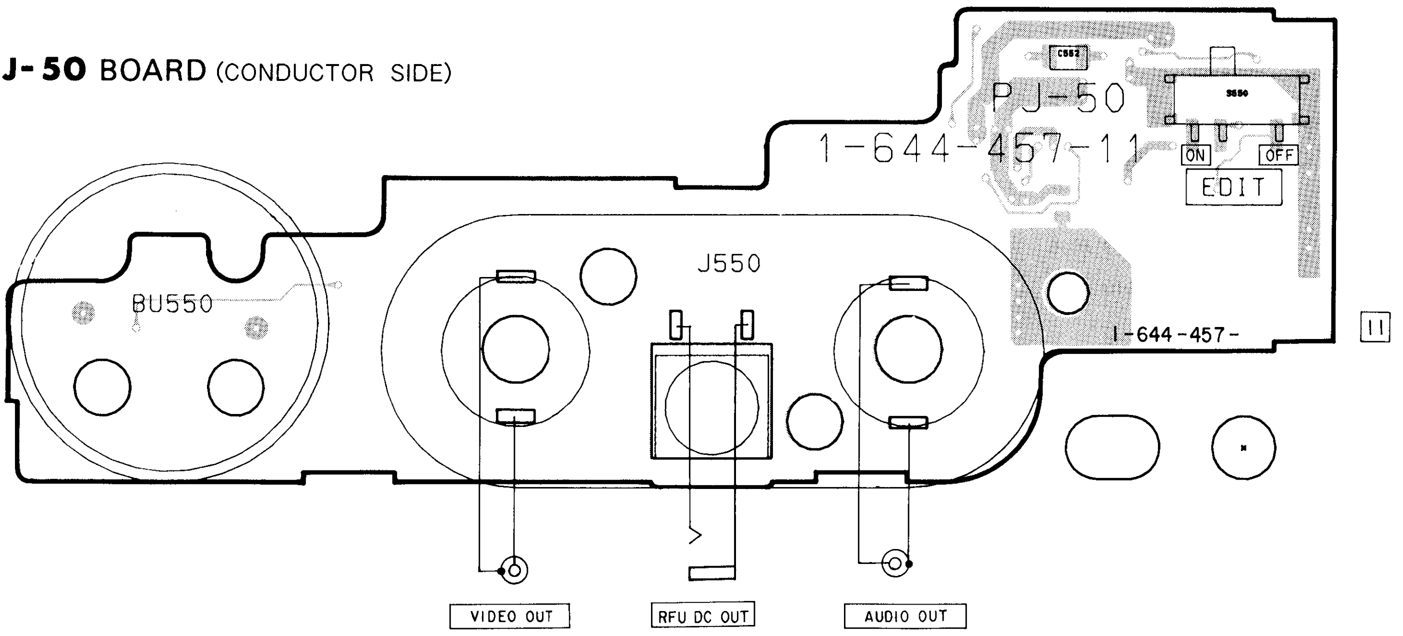
(DIODE)

D550	8-719-404-46	DIODE	MA110
D551	8-719-110-03	DIODE	RD7. 5ES-B2
D552	8-719-110-03	DIODE	RD7. 5ES-B2

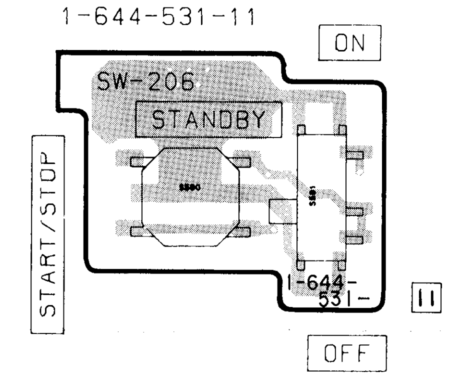
PJ-50 BOARD (COMPONENT SIDE)


PJ-50
1-644-457-11

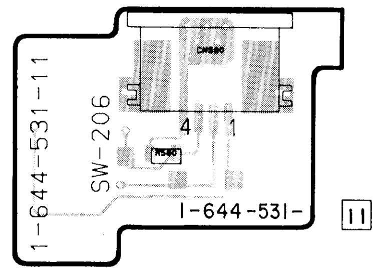
PJ-50 BOARD (CONDUCTOR SIDE)


PJ-50
1-644-457-11
ON
OFF
EDIT
J550
BU550
1-644-457-
VIDEO OUT
RFU DC OUT
AUDIO OUT

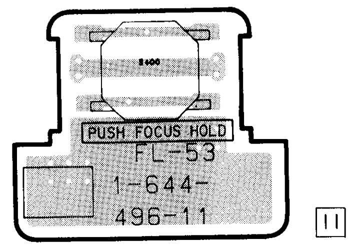
SW-206 BOARD (COMPONENT SIDE)


1-644-531-11
ON
SW-206
STANDBY
START/STOP
1-644-531-
OFF

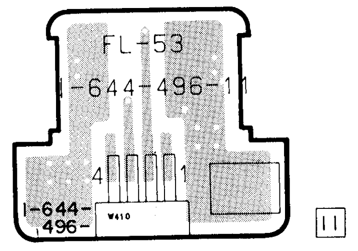
SW-206 BOARD (CONDUCTOR SIDE)


1-644-531-11
SW-206
1-644-531-

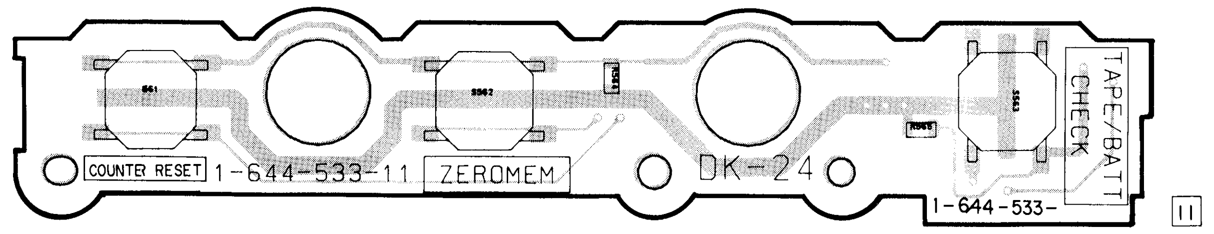
FL-53 BOARD (COMPONENT SIDE)


PUSH FOCUS HOLD
FL-53
1-644-496-11

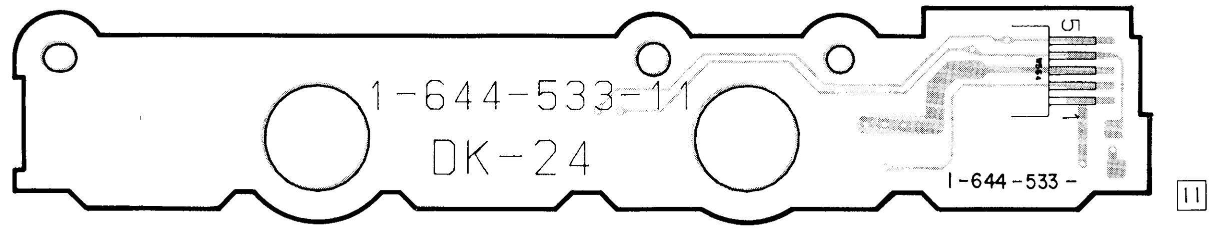
FL-53 BOARD (CONDUCTOR SIDE)


FL-53
1-644-496-11
1-644-496-

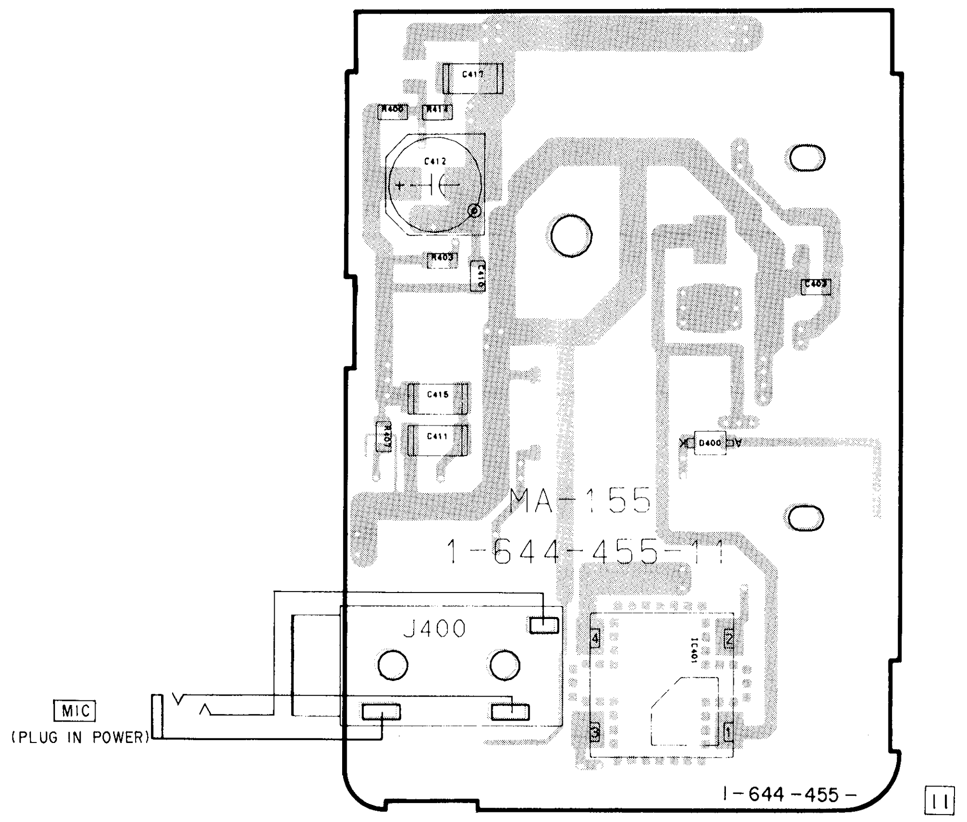
DK-24 BOARD (COMPONENT SIDE)


COUNTER RESET
1-644-533-11
ZEROMEM
DK-24
TAPE/BATT CHECK
1-644-533-

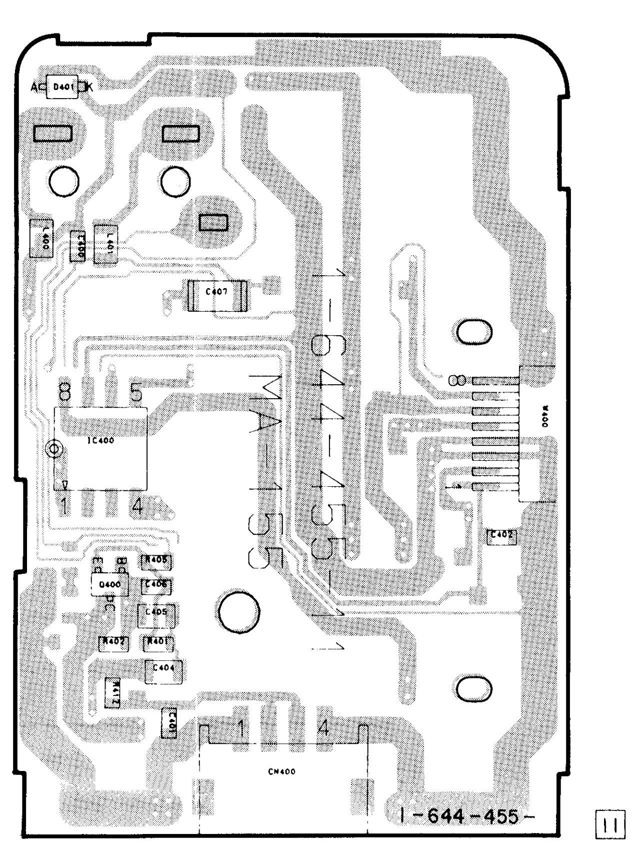
DK-24 BOARD (CONDUCTOR SIDE)


1-644-533-11
DK-24
1-644-533-

MA-155 BOARD (COMPONENT SIDE)


MA-155
1-644-455-11
J400
MIC (PLUG IN POWER)
1-644-455-

MA-155 BOARD (CONDUCTOR SIDE)


1-644-455-11
MA-155
1-644-455-

(DIODE)

D400	8-719-110-03	DIODE	RD7. 5ES-B2
D401	8-719-110-03	DIODE	RD7. 5ES-B2

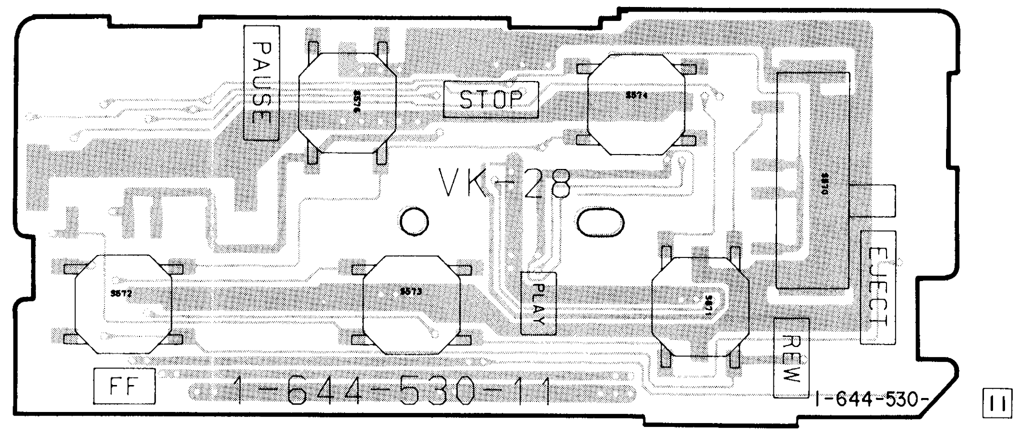
(IC)

IC400	8-759-822-37	IC	LA7293M-TE-L
IC401	8-749-923-29	IC	RS-20E-T

(TRANSISTOR)

Q400	8-729-010-60	TRANSISTOR	MSA1586-BC

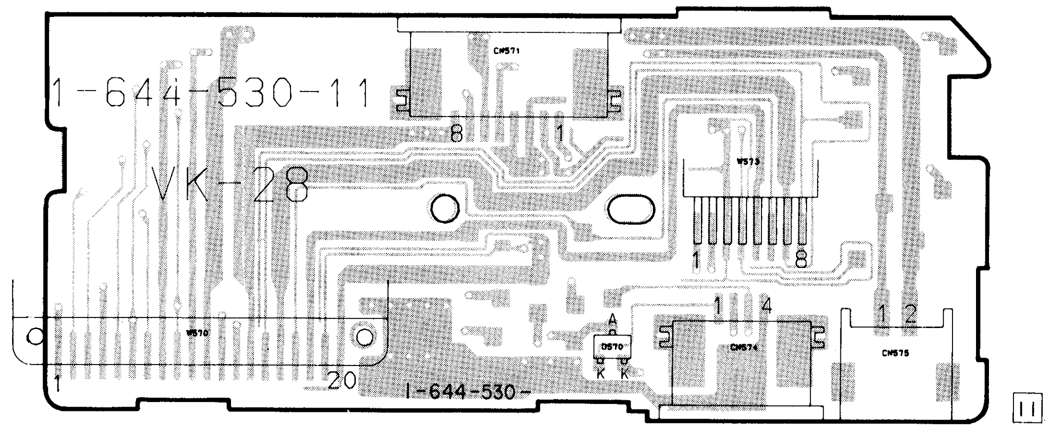
VK-28 BOARD (COMPONENT SIDE)


PAUSE
STOP
VK-28
EJECT
PLAY
REW
FF
1-644-530-11
1-644-530-

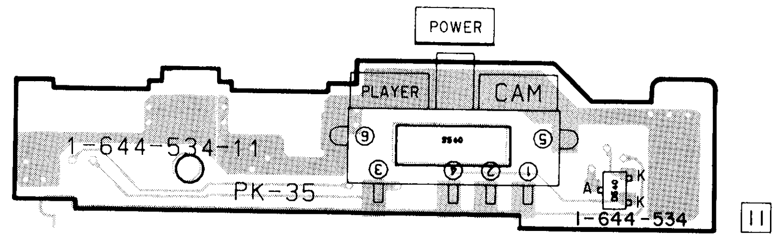
(DIODE)

D570	8-719-820-05	DIODE	1SS181

VK-28 BOARD (CONDUCTOR SIDE)


1-644-530-11
VK-28
1-644-530-

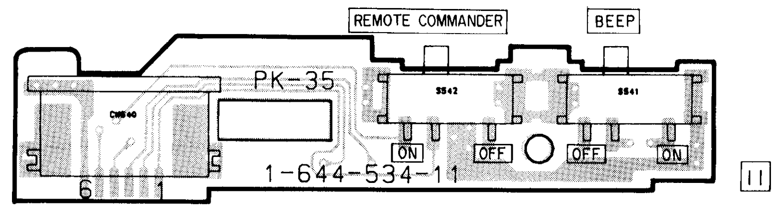
PK-35 BOARD (COMPONENT SIDE)


POWER
PLAYER
CAM
1-644-534-11
PK-35
1-644-534

(DIODE)

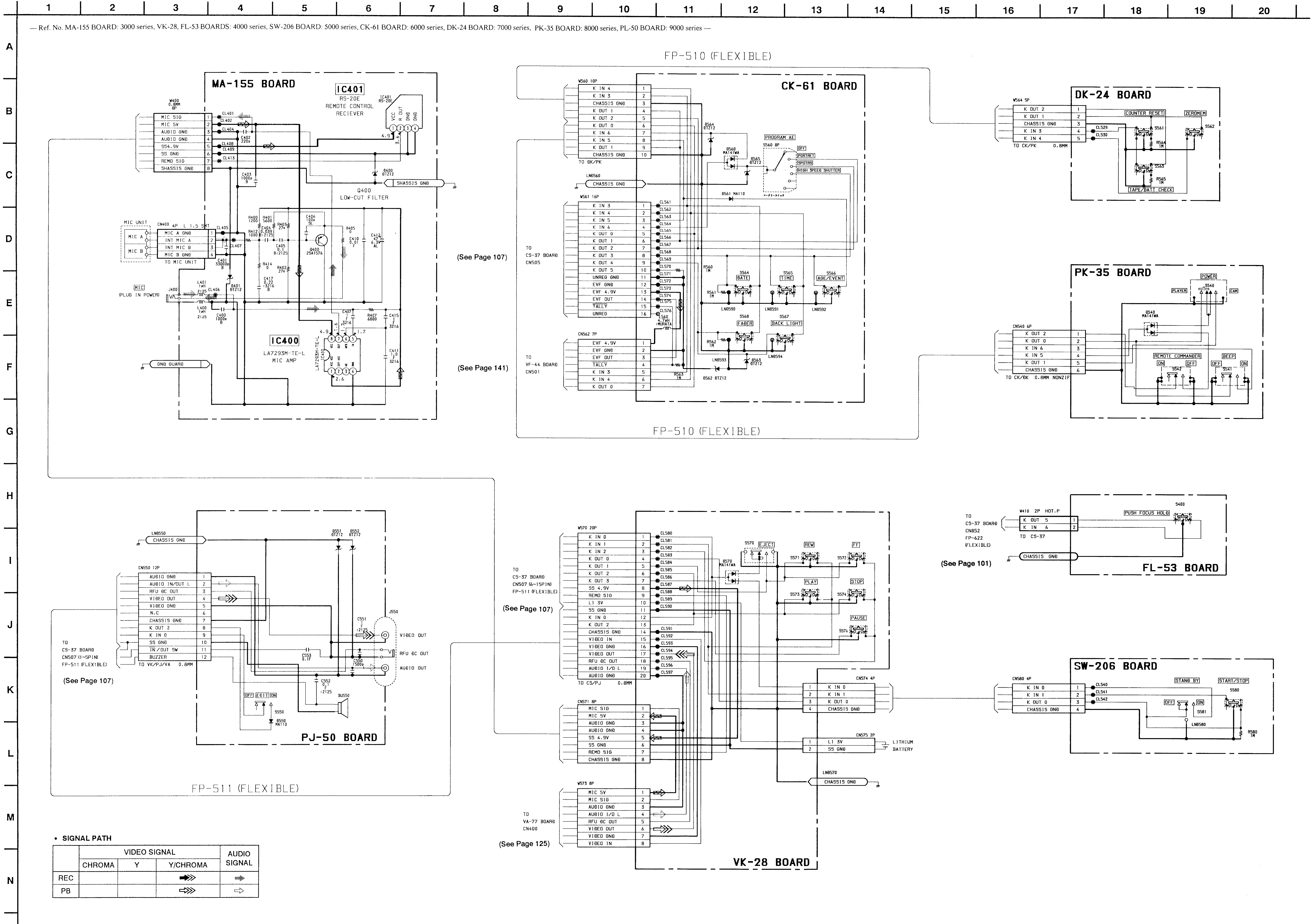
D540	8-719-820-05	DIODE	1SS181

PK-35 BOARD (CONDUCTOR SIDE)


REMOTE COMMANDER
BEEP
PK-35
ON
OFF
OFF
ON
1-644-534-11

MA-155 (MIC AMP), VK-28 (VTR CONTROL SWITCH), FL-53 (PUSH FOCUS HOLD SWITCH), SW-206 (CAMERA START/STOP), CK-61 (CAMERA CONTROL SWITCH), DK-24 (RESET SWITCH), PK-35 (CAMERA/PLAYER SWITCH), PL-50 (VIDEO/AUDIO OUT) SCHEMATIC DIAGRAMS

— Ref. No. MA-155 BOARD: 3000 series, VK-28, FL-53 BOARDS: 4000 series, SW-206 BOARD: 5000 series, CK-61 BOARD: 6000 series, DK-24 BOARD: 7000 series, PK-35 BOARD: 8000 series, PL-50 BOARD: 9000 series —

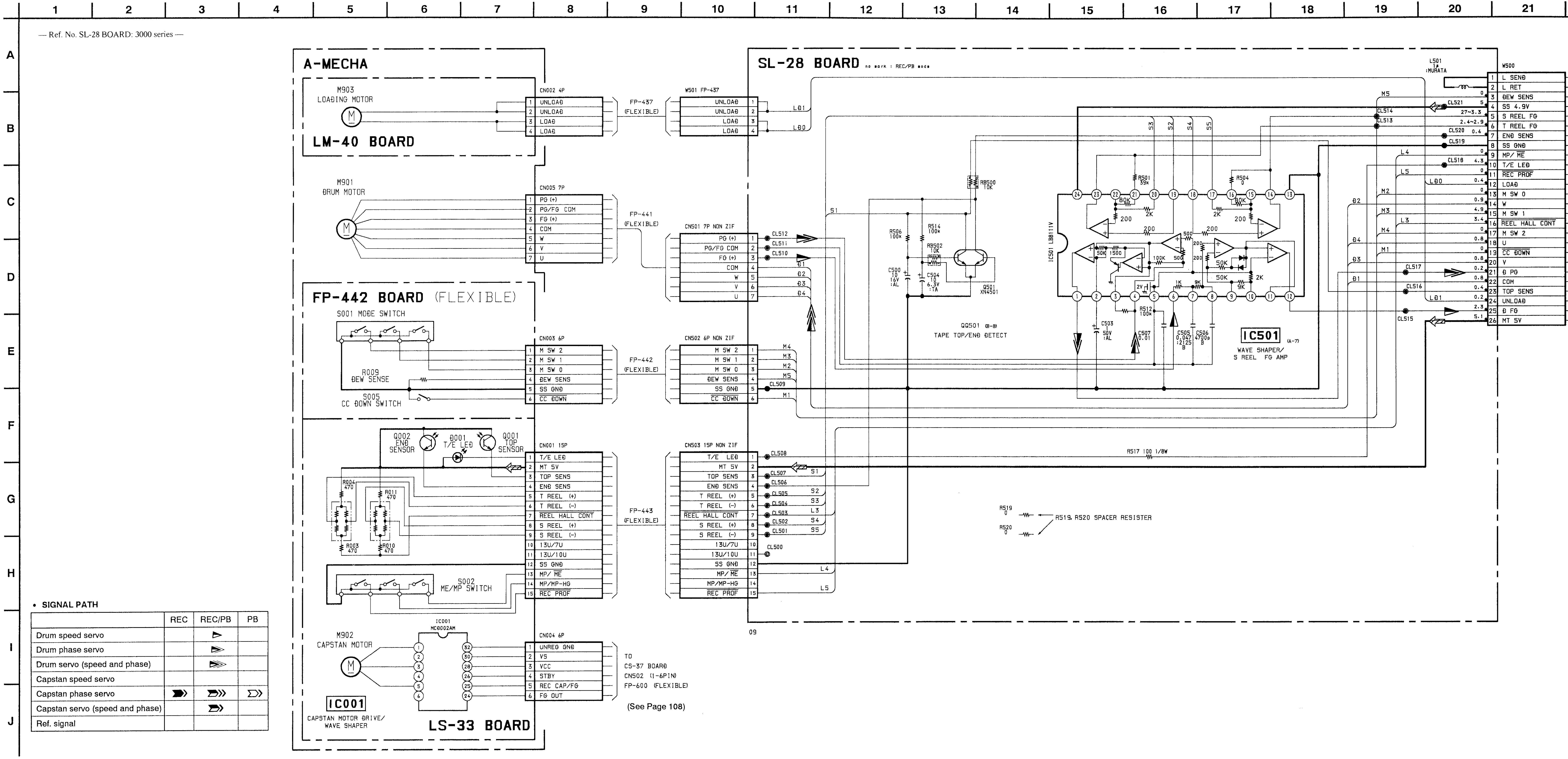


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
A B C D E F G H I J K L M N
MA-155 BOARD
IC401 RS-20E REMOTE CONTROL RECIEVER
Q400 LOW-CUT FILTER
IC400 LA7293M-TE-L MIC AMP
MIC UNIT
TO MIC UNIT
MIC (PLUG IN POWER)
GND GUARD
SHASSIS GND
FP-510 (FLEXIBLE)
CK-61 BOARD
PROGRAM AE
TO CS-37 BOARD CN505
TO VF-44 BOARD CN501
(See Page 107)
(See Page 141)
DK-24 BOARD
COUNTER RESET
ZERO MEM
TAPE/BATT CHECK
TO CK/PK 0.8MM
PK-35 BOARD
POWER
PLAYER
CAM
REMOTE COMMANDER
BEEP
TO CK/DK 0.8MM NONZIF
FL-53 BOARD
PUSH FOCUS HOLD
TO CS-37 BOARD CN852 FP-622 (FLEXIBLE)
(See Page 101)
PJ-50 BOARD
VIDEO OUT
RFU DC OUT
AUDIO OUT
TO CS-37 BOARD CN507 (1~5PIN) FP-511 (FLEXIBLE)
(See Page 107)
FP-511 (FLEXIBLE)
VK-28 BOARD
EJECT
REW
FF
PLAY
STOP
PAUSE
TO CS-37 BOARD CN507 (6~15PIN) FP-511 (FLEXIBLE)
(See Page 107)
TO VA-77 BOARD CN400
(See Page 125)
LITHIUM BATTERY
SW-206 BOARD
STAND BY
START/STOP

• **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	➡
PB			⇨	⇨

SL-28 (MECH CONTROL) SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
A
B
C
D
E
F
G
H
I
J
A-MECHA
M903
LOADING MOTOR
LM-40 BOARD
CN002 4P
UNLOAD
UNLOAD
LOAD
LOAD
FP-437
(FLEXIBLE)
W501 FP-437
M901
DRUM MOTOR
CN005 7P
PG (+)
PG/FG COM
FG (+)
COM
W
V
U
FP-441
(FLEXIBLE)
CN501 7P NON ZIF
FP-442 BOARD (FLEXIBLE)
S001 MODE SWITCH
R009
DEW SENSE
S005
CC DOWN SWITCH
CN003 6P
M SW 2
M SW 1
M SW 0
DEW SENS
SS GND
CC DOWN
FP-442
(FLEXIBLE)
CN502 6P NON ZIF
Q002
END SENSOR
D001
T/E LED
Q001
TOP SENSOR
R004
470
R011
470
R003
470
R010
470
CN001 15P
T/E LED
MT 5V
TOP SENS
END SENS
T REEL (+)
T REEL (-)
REEL HALL CONT
S REEL (+)
S REEL (-)
13U/7U
13U/10U
SS GND
MP/ ME
MP/MP-HG
REC PROF
S002
ME/MP SWITCH
FP-443
(FLEXIBLE)
CN503 15P NON ZIF
M902
CAPSTAN MOTOR
IC001
MC0002AM
IC001
CAPSTAN MOTOR DRIVE/
WAVE SHAPER
LS-33 BOARD
CN004 6P
UNREG GND
VS
VCC
STBY
REC CAP/FG
FG OUT
TO
CS-37 BOARD
CN502 (1-6PIN)
FP-600 (FLEXIBLE)
(See Page 108)
SL-28 BOARD
L501
1μ
:MURATA
W500
L SEND
L RET
DEW SENS
SS 4.9V
S REEL FG
T REEL FG
END SENS
SS GND
MP/ ME
T/E LED
REC PROF
LOAD
M SW 0
W
M SW 1
REEL HALL CONT
M SW 2
U
CC DOWN
V
D PG
COM
TOP SENS
UNLOAD
D FG
MT 5V
QQ501
TAPE TOP/END DETECT
Q501
XN4501
IC501 LB8111V
IC501
WAVE SHAPER/
S REEL FG AMP
R517 100 1/8W
R519
R520
R519, R520 SPACER RESISTER
09

— Ref. No. SL-28 BOARD: 3000 series —

- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷>	
Drum servo (speed and phase)		▷≫	
Capstan speed servo			
Capstan phase servo	➧›	➧»	⊃›
Capstan servo (speed and phase)		➧›	
Ref. signal			

SL-28 (MECH CONTROL) PRINTED WIRING BOARD

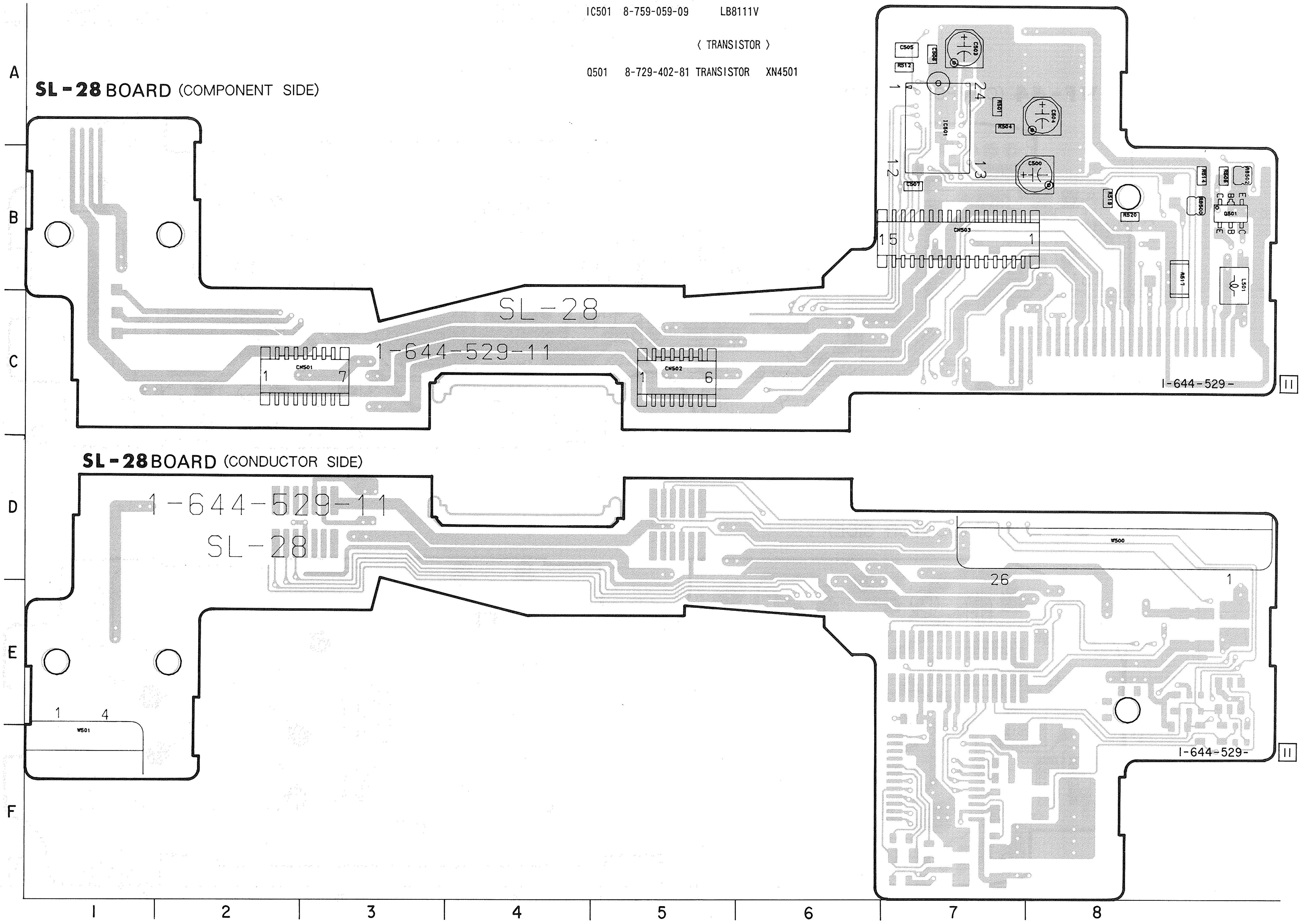
— Ref. No. SL-28 BOARD: 3000 series —

〈 IC 〉

IC501 8-759-059-09 LB8111V

〈 TRANSISTOR 〉

Q501 8-729-402-81 TRANSISTOR XN4501


SL-28 BOARD (COMPONENT SIDE)
SL-28 BOARD (CONDUCTOR SIDE)
A
B
C
D
E
F
1
2
3
4
5
6
7
8
SL-28
1-644-529-11
CN501
CN502
CN503
IC501
C500
C501
C503
C504
C505
C508
R501
R504
R512
R514
R517
R518
R520
R502
RB501
RB502
RB503
Q501
L501
W500
W501
1-644-529-
11
1
4
6
7
12
13
15
24
26
E
B
C

VF-44 (VIEW FINDER) PRINTED WIRING BOARD

— Ref. No. VF-44 BOARD: 2000 series —

(DIODE)

Ref.	Part No.	Description	Type
⚠D501	8-719-024-87	DIODE	LN1261CAL
D502	8-719-024-87	DIODE	LN1261CAL
D503	8-719-400-20	DIODE	MA152WA

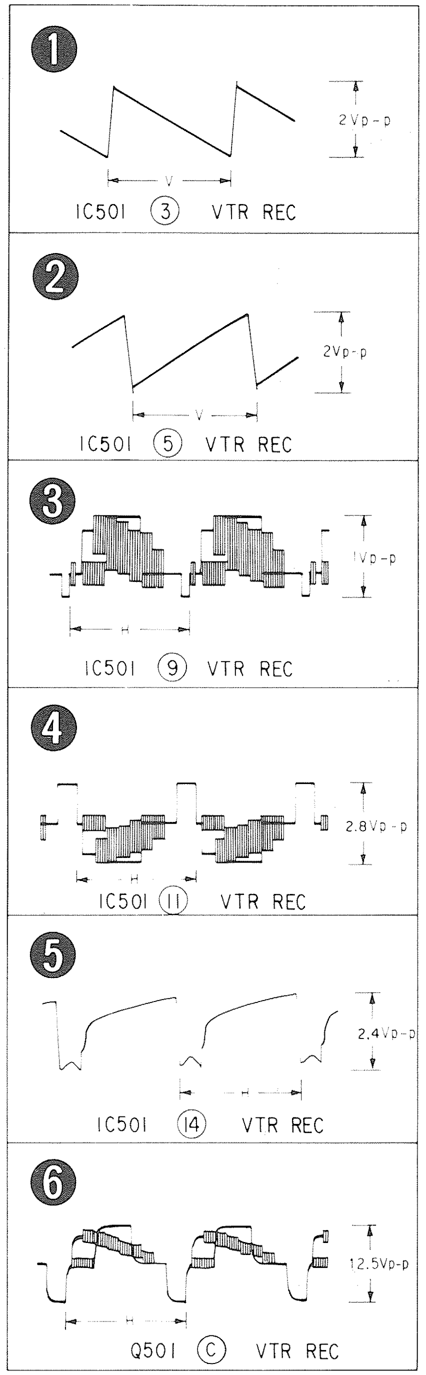
(IC)

Ref.	Part No.	Description	Type
IC501	8-759-420-01	IC	AN2512S

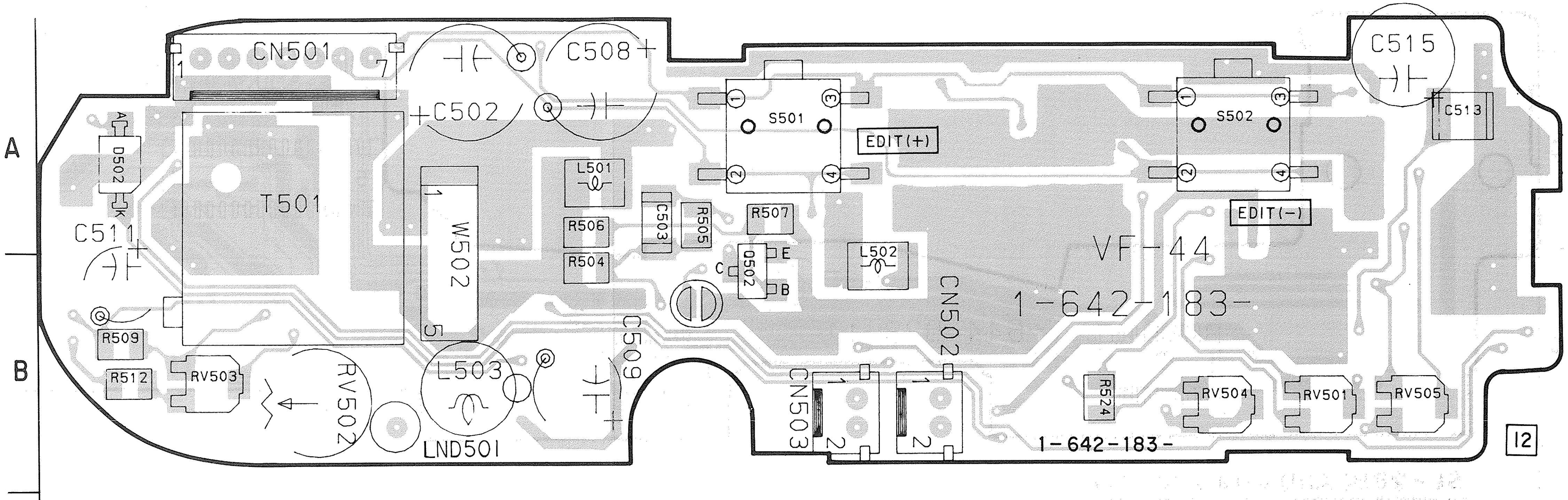
(TRANSISTOR)

Ref.	Part No.	Description	Type
Q501	8-729-216-31	TRANSISTOR	2SA1163-G
Q502	8-729-100-66	TRANSISTOR	2SC1623-L5L6
Q503	8-729-106-68	TRANSISTOR	2SD1615A-GP

VF-44 BOARD

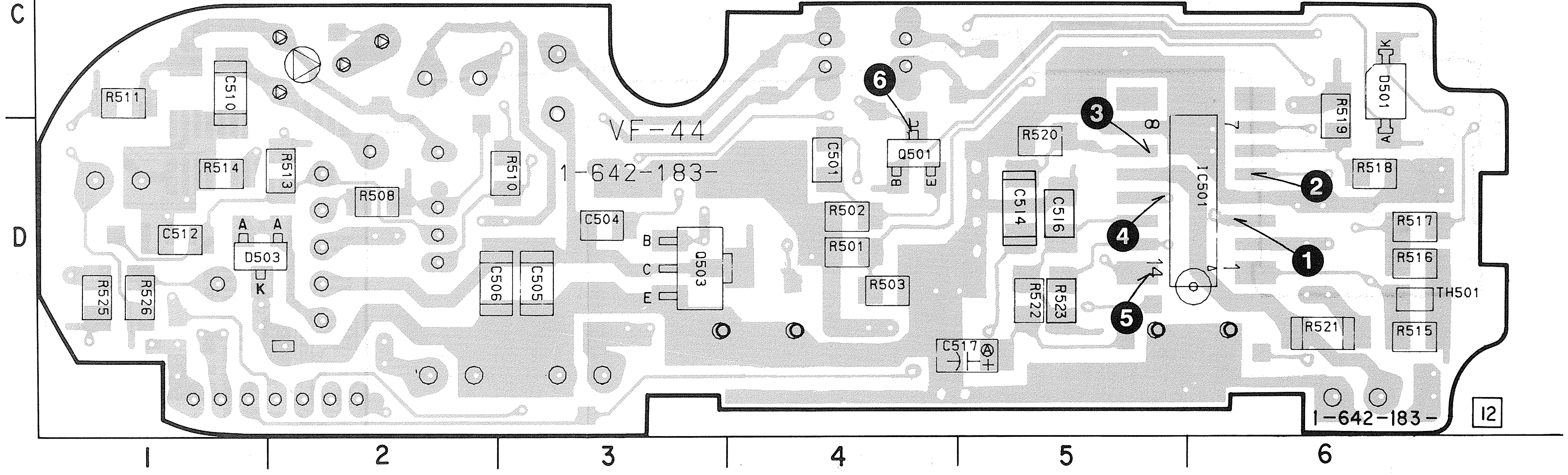


VF-44 (COMPONENT SIDE)



A
B
CN501
1
7
C502
C508
C511
T501
W502
1
5
D502
A
K
R509
R512
RV503
RV502
L503
LND501
C509
L501
R506
R504
C503
R505
R507
Q502
C
E
B
S501
1
2
3
4
EDIT(+)
L502
CN502
CN503
1
2
S502
EDIT(−)
VF-44
1-642-183-
C515
C513
R524
RV504
RV501
RV505
12

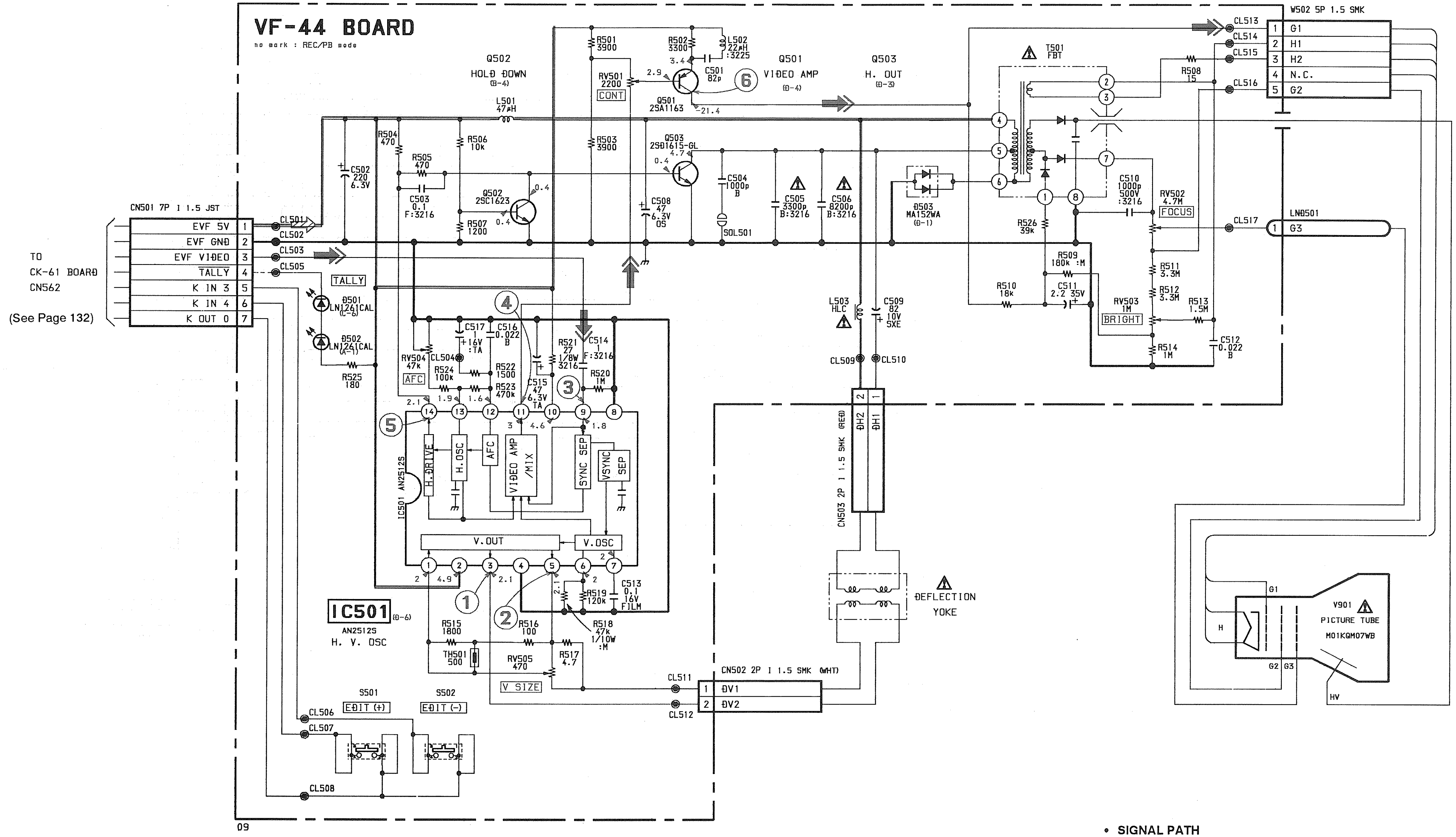
VF-44 (CONDUCTOR SIDE)



C
D
R511
C510
R514
R513
R508
C512
D503
A
K
R525
R526
C506
C505
R510
C504
VF-44
1-642-183-
Q503
B
C
E
C501
Q501
B
E
❻
R502
R501
R503
R520
C514
C516
R522
R523
C517
IC501
8
7
14
1
❶
❷
❸
❹
❺
R519
D501
K
A
R518
R517
R516
TH501
R521
R515
1-642-183-
12
1
2
3
4
5
6

VF-44 (VIEW FINDER) SCHEMATIC DIAGRAM

— Ref. No. VF-44 BOARD: 2000 series —

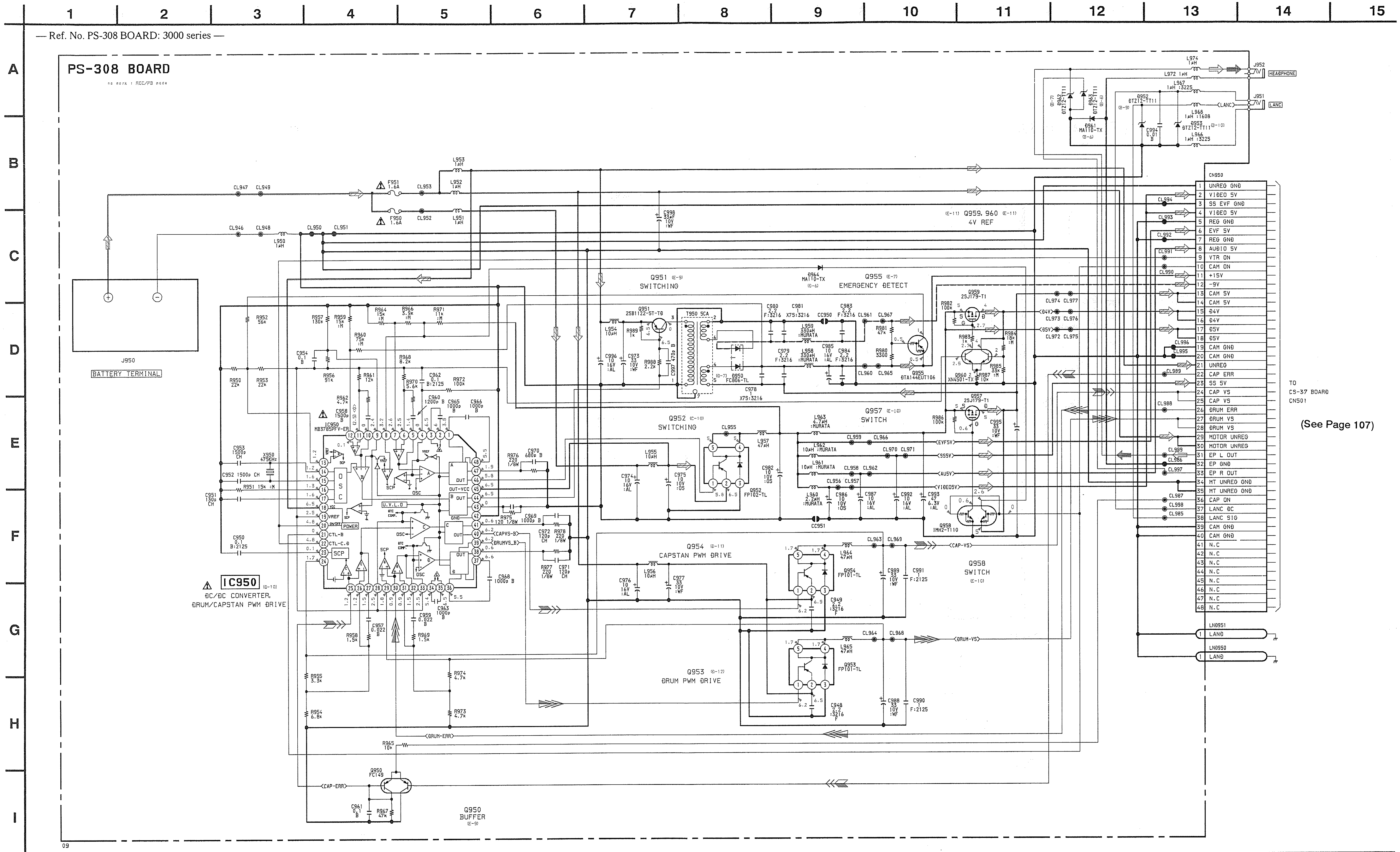

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
VF-44 BOARD
no mark : REC/PB mode
Q502
HOLD DOWN
(B-4)
L501
47μH
R501
3900
RV501
2200
CONT
R502
3300
L502
22μH
:3225
C501
82p
Q501
2SA1163
Q501
VIDEO AMP
(B-4)
Q503
H. OUT
(B-3)
T501
FBT
R508
15
CL513
CL514
CL515
CL516
W502 5P 1.5 SMK
G1
H1
H2
N.C.
G2
R504
470
R506
10k
R505
470
C502
220
6.3V
C503
0.1
F:3216
Q502
2SC1623
R507
1200
R503
3900
Q503
2SD1615-GL
C508
47
6.3V
OS
C504
1000p
B
SOL501
C505
3300p
B:3216
C506
8200p
B:3216
D503
MA152WA
(B-1)
R526
39k
C510
1000p
500V
:3216
RV502
4.7M
FOCUS
CL517
LND501
G3
CN501 7P 1.5 JST
EVF 5V
EVF GND
EVF VIDEO
TALLY
K IN 3
K IN 4
K OUT 0
CL501
CL502
CL503
CL505
TO
CK-61 BOARD
CN562
(See Page 132)
TALLY
D501
LN1261CAL
(C-6)
D502
LN1261CAL
(A-1)
R525
180
R509
180k :M
C511
2.2 35V
R510
18k
RV503
1M
BRIGHT
R511
3.3M
R512
3.3M
R513
1.5M
R514
1M
C512
0.022
B
L503
HLC
C509
82
10V
SXE
CL509
CL510
C517
1
16V
:TA
C516
0.022
B
RV504
47k
AFC
CL504
R524
100k
R522
1500
R523
470k
C515
47
6.3V
TA
R521
27
1/8W
3216
C514
1
F:3216
R520
1M
H.DRIVE
H.OSC
AFC
VIDEO AMP
/MIX
SYNC SEP
VSYNC
SEP
IC501 AN2512S
V.OUT
V.OSC
IC501
(B-6)
AN2512S
H. V. OSC
C513
0.1
16V
FILM
R519
120k
R518
47k
1/10W
:M
R515
1800
R516
100
TH501
500
RV505
470
V SIZE
R517
4.7
CN503 2P 1.5 SMK (RED)
DH2
DH1
DEFLECTION
YOKE
CN502 2P 1.5 SMK (WHT)
DV1
DV2
CL511
CL512
S501
EDIT (+)
S502
EDIT (−)
CL506
CL507
CL508
G1
H
V901
PICTURE TUBE
M01KQM07WB
G2
G3
HV
09
①
②
③
④
⑤
⑥

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC		⇒		
PB				

PS-308 (POWER/MECH DRIVE) SCHEMATIC DIAGRAM

— Ref. No. PS-308 BOARD: 3000 series —


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
PS-308 BOARD
J950
BATTERY TERMINAL
F951 1.6A
F950 1.6A
IC950
DC/DC CONVERTER, DRUM/CAPSTAN PWM DRIVE
MB3785PFV-ER
Q951 SWITCHING
Q955 EMERGENCY DETECT
Q959, 960 4V REF
Q952 SWITCHING
Q957 SWITCH
Q954 CAPSTAN PWM DRIVE
Q958 SWITCH
Q953 DRUM PWM DRIVE
Q950 BUFFER
T950 SCA
J952 HEADPHONE
J951 LANC
CN950
1 UNREG GND
2 VIDEO 5V
3 SS EVF GND
4 VIDEO 5V
5 REG GND
6 EVF 5V
7 REG GND
8 AUDIO 5V
9 VTR ON
10 CAM ON
11 +15V
12 -9V
13 CAM 5V
14 CAM 5V
15 D4V
16 D4V
17 D5V
18 D5V
19 CAM GND
20 CAM GND
21 UNREG
22 CAP ERR
23 SS 5V
24 CAP VS
25 CAP VS
26 DRUM ERR
27 DRUM VS
28 DRUM VS
29 MOTOR UNREG
30 MOTOR UNREG
31 EP L OUT
32 EP GND
33 EP R OUT
34 MT UNREG GND
35 MT UNREG GND
36 CAP ON
37 LANC DC
38 LANC SIG
39 CAM GND
40 CAM GND
41 N.C
42 N.C
43 N.C
44 N.C
45 N.C
46 N.C
47 N.C
48 N.C
LND951 1 LAND
LND950 1 LAND
TO CS-37 BOARD CN501
(See Page 107)
<CAP-VS>
<DRUM-VS>
<DRUM-ERR>
<CAP-ERR>
<EVF5V>
<SS5V>
<AU5V>
<VIDEO5V>
<LANC>
09

- **SIGNAL PATH**

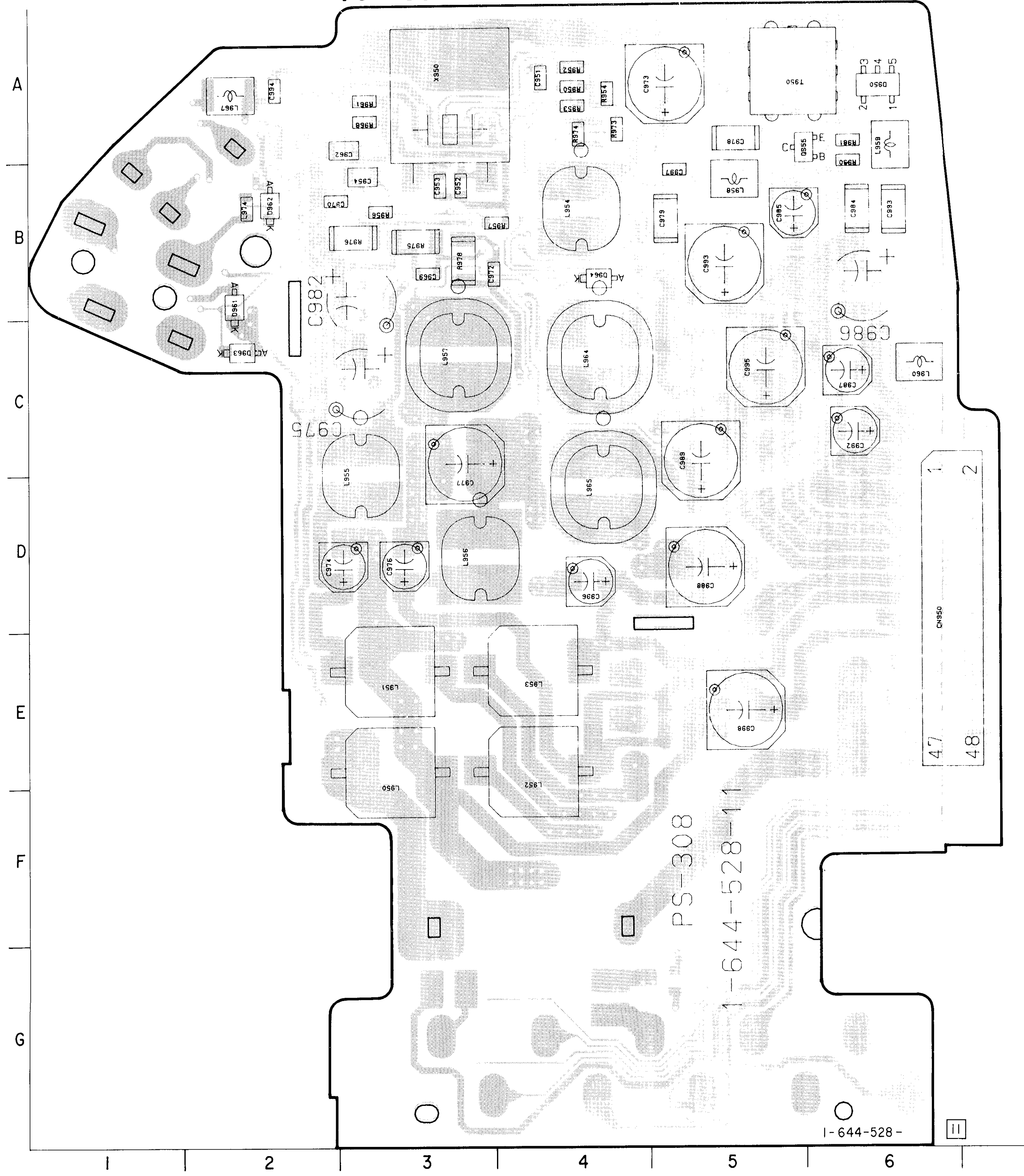
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡》	➡
PB			⇨》	⇨

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		⊳	
Drum servo (speed and phase)		⊳	
Capstan phase servo	➡》	⇨》	⊃》
Capstan servo (speed and phase)		⇨》	

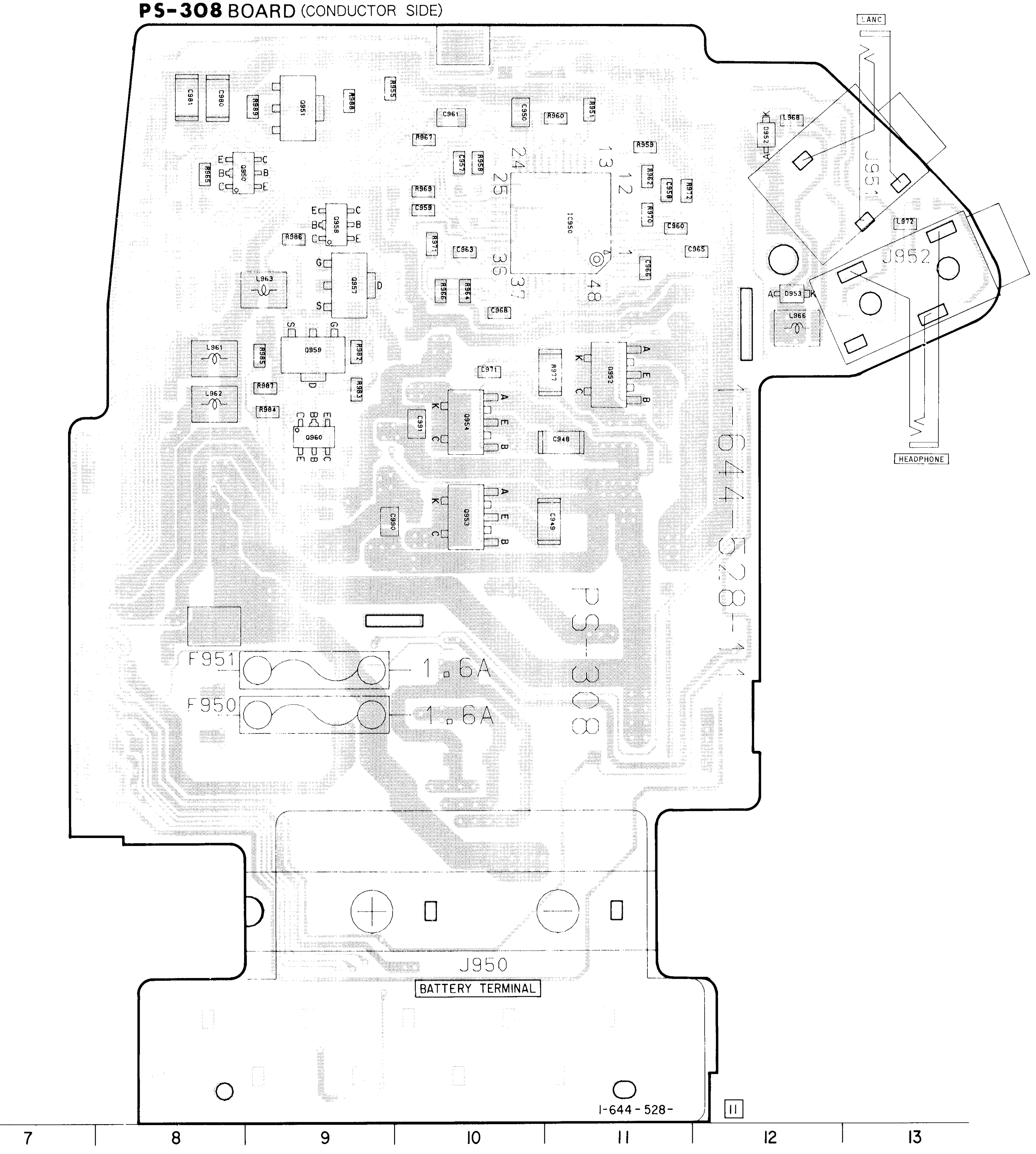
PS-308 (POWER/MECH DRIVE) PRINTED WIRING BOARD

— Ref. No. PS-308 BOARD: 3000 series —

PS-308 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
1
2
3
4
5
6
PS-308
1-644-528-11
1-644-528-
11
CN950
1
2
47
48
T950
Q950
L951
L953
L950
L952
L954
L955
L956
L957
L964
L965
L967
C973
C975
C977
C982
C986
C988
C989
C990
C993
C998

PS-308 BOARD (CONDUCTOR SIDE)


7
8
9
10
11
12
13
LANC
HEADPHONE
J951
J952
IC950
F951
1.6A
F950
1.6A
PS-308
1-644-528-11
J950
BATTERY TERMINAL
1-644-528-
11

(DIODE)

D950	8-719-989-33	DIODE	FC806
D952	8-719-110-03	DIODE	RD7. 5ES-B2
D953	8-719-110-03	DIODE	RD7. 5ES-B2
D961	8-719-404-46	DIODE	MA110
D962	8-719-110-03	DIODE	RD7. 5ES-B2
D963	8-719-110-03	DIODE	RD7. 5ES-B2
D964	8-719-404-46	DIODE	MA110

(IC)

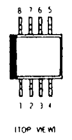
⚠IC950	8-759-060-94	IC	MB3785APFV-G-BND-ER

(TRANSISTOR)

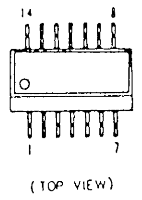
Q950	8-729-823-95	TRANSISTOR	FC149
Q951	8-729-804-41	TRANSISTOR	2SB1122-S
Q952	8-729-823-84	TRANSISTOR	FP102
Q953	8-729-823-82	TRANSISTOR	FP101
Q954	8-729-823-82	TRANSISTOR	FP101
Q955	8-729-905-12	TRANSISTOR	DTA144EU
Q957	8-729-011-26	TRANSISTOR	2SJ179
Q958	8-729-920-48	TRANSISTOR	IMH2
Q959	8-729-011-26	TRANSISTOR	2SJ179
Q960	8-729-402-81	TRANSISTOR	XN4501

4-3. SEMICONDUCTORS

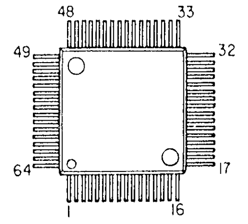
AK6420F
LM358D


8 7 6 5
1 2 3 4
(TOP VIEW)

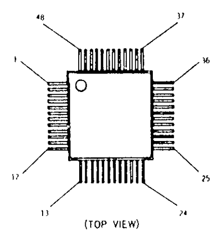
AN2512S


14
8
1
7
(TOP VIEW)

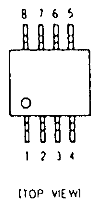
CXA1207AR
CXD1257R


48
33
49
32
64
17
1
16

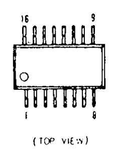
CXA1208R
CXA-1488R
CXA1507BR
TB1206F-EL



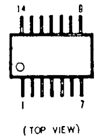
CXA1211M
LA7293M
RC3414M


8 7 6 5
1 2 3 4
(TOP VIEW)

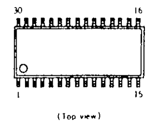
CXA1448N
CXA1452
M62353GP
µPD6456GS-618-E2


16
9
1
8
(TOP VIEW)

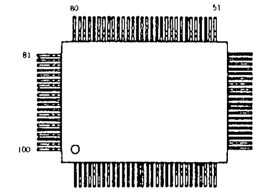
CXA1452
CXL5502M
TL1596CDB


14
8
1
7
(TOP VIEW)

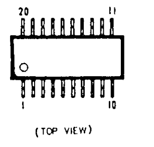
CXA8006M


30
16
1
15
(TOP VIEW)

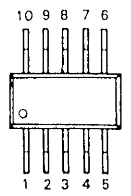
CXD2100AQ
CXP80624-278Q/283Q



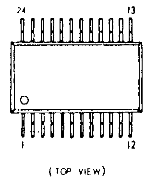
CXD2104N
M62352GP
MPC1720M
MPC1724M
µPD7564G-540


20
11
1
10
(TOP VIEW)

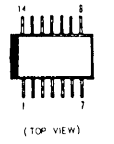
LB1830M


10 9 8 7 6
1 2 3 4 5

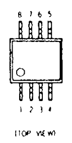
LB8111V


24
13
1
12
(TOP VIEW)

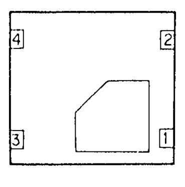
LM324D


14
8
1
7
(TOP VIEW)

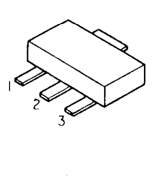
NJM2235M


8 7 6 5
1 2 3 4
(TOP VIEW)

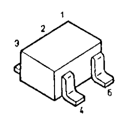
RS-20E-T



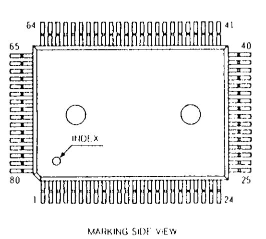
S-81350HG-KD



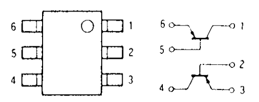
SC7S04F
TC4S66F



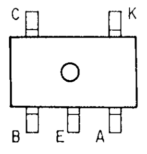
µPD75316GF-234-3B9


MARKING SIDE VIEW

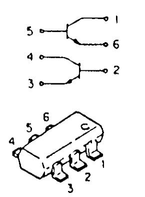
FC149
IMT2
XN4401



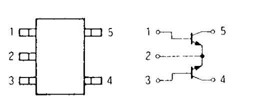
FP101
FP102



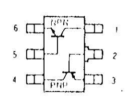
IMH2
XN4215
XN4501



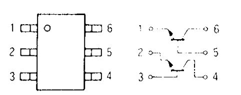
XN1501



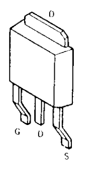
XN4312
XN4601



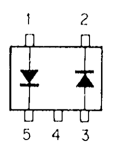
XN6401



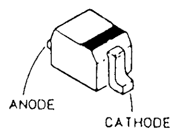
2SJ179



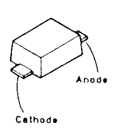
FC806-TL



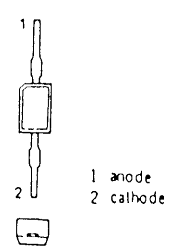
MA110


ANODE
CATHODE

MA728


Anode
Cathode

LN1261CAL


1
2
1 anode
2 cathode

SECTION 5
EXPLODED VIEWS

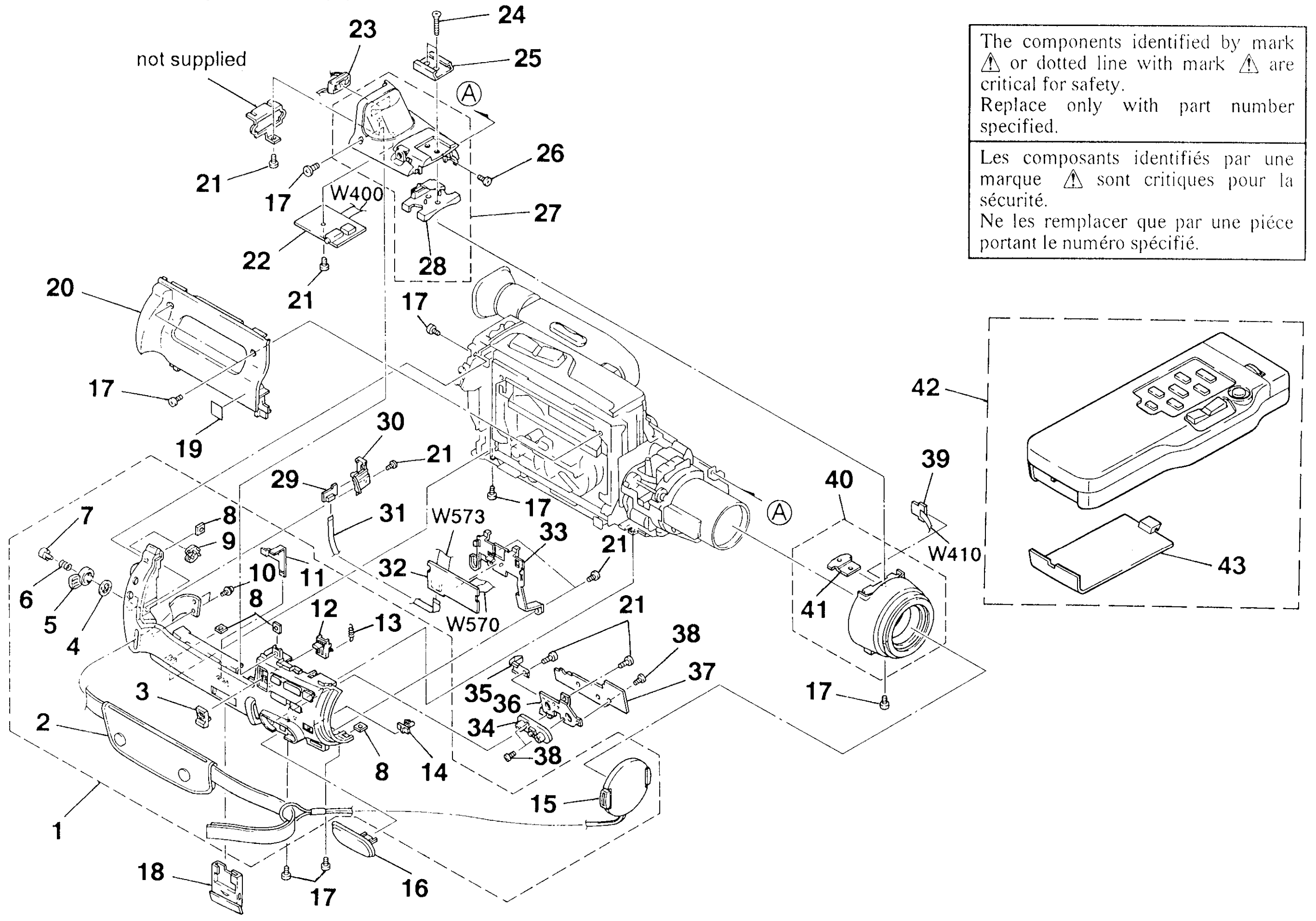
NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

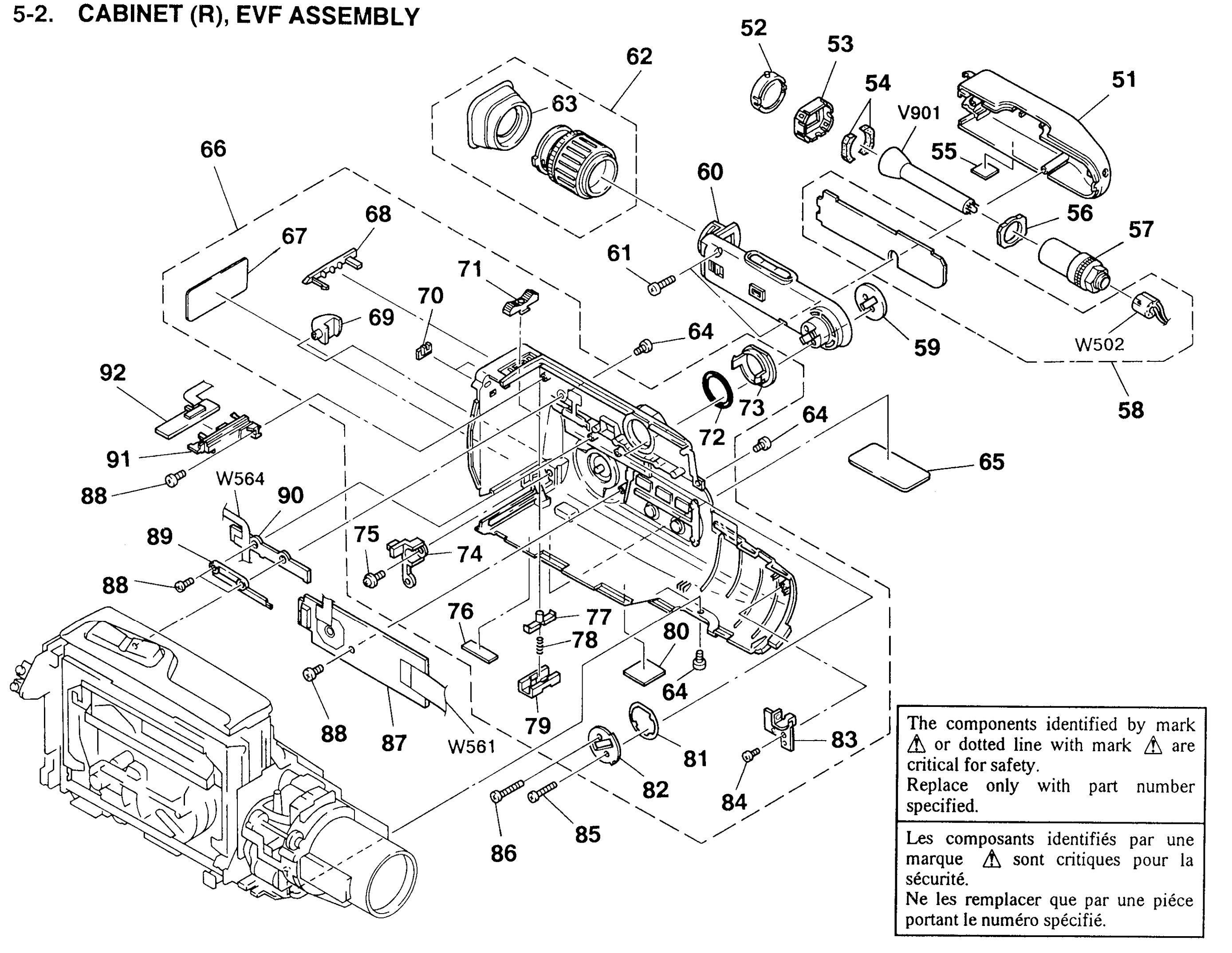
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

5-1. CABINET (UPPER), (L) ASSEMBLY


not supplied
23
24
25
A
26
21
17
W400
27
22
28
21
17
20
17
19
30
21
29
31
W573
17
33
21
7
8
9
10
11
6
8
12
5
4
13
W570
32
21
3
38
37
35
36
34
38
2
8
14
15
1
18
17
16
40
A
39
W410
41
17
42
43

Ref. No.	Part No.	Description	Remark
1	X-3941-742-1	CABINET (L) ASSY (FX310)	
1	X-3941-786-1	CABINET (L) ASSY (FX311)	
2	3-736-807-01	BELT, GRIP	
3	3-946-195-01	BUTTON, EJECT	
4	3-736-364-01	SPRING	
5	3-942-985-01	KNOB, STAND-BY	
6	3-578-221-00	SPRING, COMPRESSION	
7	3-736-343-01	BUTTON, S/S	
8	3-718-233-01	NUT, PLATE	
9	3-946-260-01	HOLDER, STAND-BY KNOB	
10	3-669-480-21	+ PTPWH 2	
11	1-550-743-11	HOLDER, BATTERY	
12	3-946-194-01	LOCK, EJECT	
13	3-570-896-00	SPRING, TENSION	
14	3-946-187-01	BUTTON, EDIT	
15	A-7091-784-A	CAP BLOCK ASSY, LENS	
16	3-946-169-01	LID, JACK (FX310)	
16	3-946-169-11	LID, JACK (FX311)	
17	3-719-381-01	SCREW (M2X4)	
18	X-3941-541-1	HOLDER ASSY, LITHIUM (FX310)	
18	X-3941-664-1	HOLDER ASSY, LITHIUM (FX311)	
* 19	3-703-713-41	STICKER, SONY SYMBOL (10)	
20	X-3941-741-1	LID ASSY, CASSETTE (FX310)	
20	X-3941-778-1	LID ASSY, CASSETTE (FX311)	
21	3-948-339-01	SCREW (BTP) (2X5), HEAD (FX311)	
22	A-7063-197-A	MA-155 BOARD, COMPLETE	
23	1-542-126-41	MICROPHONE UNIT	
24	3-719-831-31	SCREW (M2X12)	
25	3-724-511-01	SHOE, ACCESSORY	
26	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
27	X-3941-321-1	CABINET (UPPER) ASSY (FX310)	
27	X-3941-666-1	CABINET (UPPER) ASSY (FX311)	
28	3-946-234-01	PRISM, REMOTE CONTROL	
29	A-7071-616-A	SW-206 BOARD, COMPLETE	
30	3-946-185-01	HOLDER, SW	
31	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
32	A-7071-613-A	VK-28 BOARD, COMPLETE	
33	3-946-259-01	HOLDER, VK	
34	1-537-402-11	TERMINAL BOARD	
35	3-947-487-01	PLATE, GROUND, PJ	
* 36	3-946-225-01	REINFORCEMENT, PJ	
37	A-7071-614-A	PJ-50 BOARD, COMPLETE	
38	3-724-455-01	SCREW (M2X4)	
39	A-7071-615-A	FL-53 BOARD, COMPLETE	
40	X-3941-751-1	CABINET (FRONT) ASSY	
41	3-946-172-01	SHEET METAL, SHOE	
* 42	1-693-017-11	REMOTE COMMANDER (CAM CODER)(RMT-509)	
43	3-947-500-01	LID, BATTERY CASE	
W400	1-690-603-11	CABLE, FLAT (FFC-25) 8P	
W410	1-696-071-11	CABLE, FLAT (FFC-95)	
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	
W573	1-690-606-11	CABLE, FLAT (FFC-32) 8P	

5-2. CABINET (R), EVF ASSEMBLY

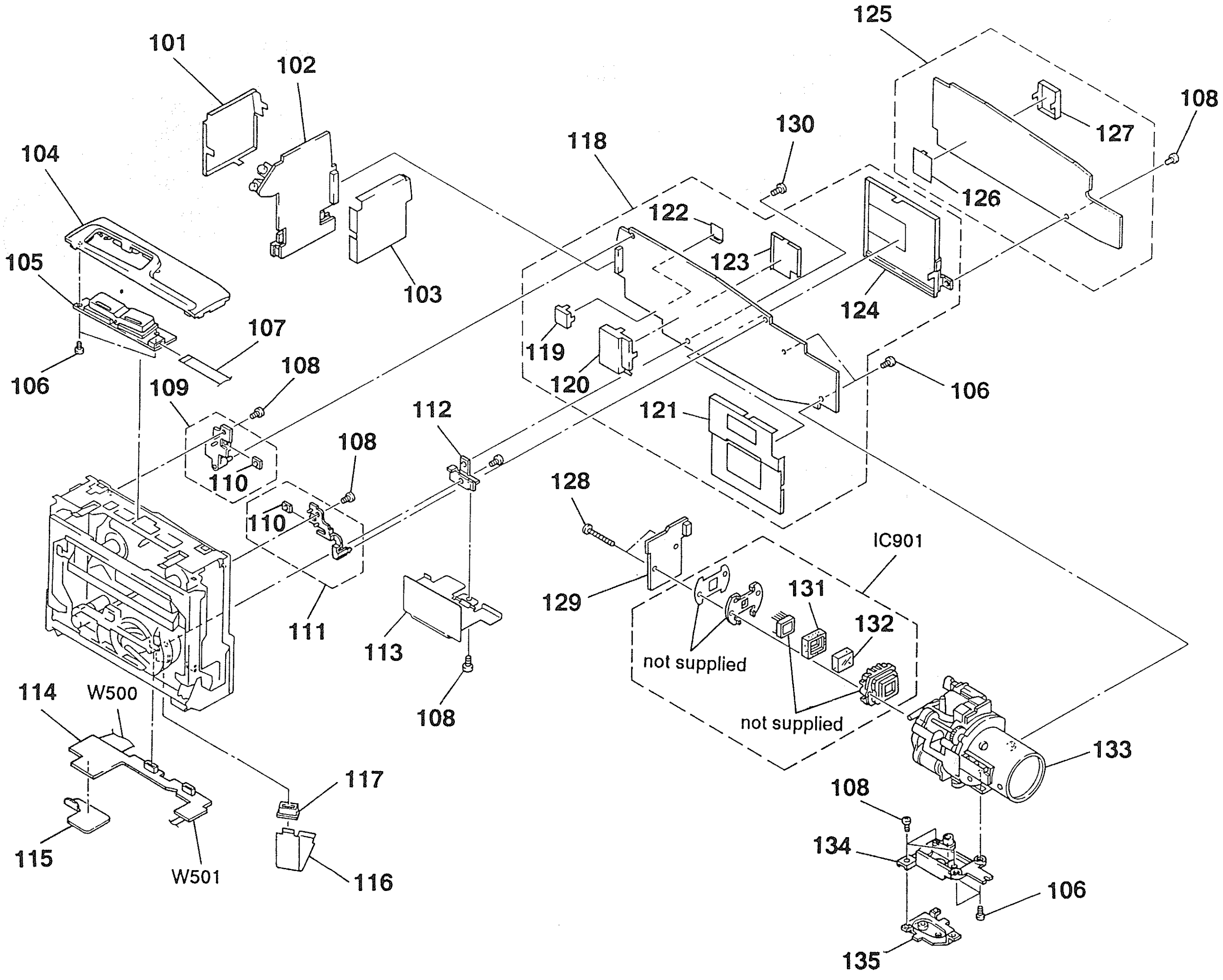

52
53
54
V901
51
62
63
66
55
60
56
57
61
67
68
71
70
69
64
59
W502
58
92
73
72
64
65
91
88
W564
90
89
75
74
88
76
77
78
80
64
88
87
W561
79
81
83
82
84
86
85

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
51	X-3941-319-1	CABINET (R) ASSY, EVF (FX310)	
51	X-3941-670-1	CABINET (R) ASSY, EVF (FX311)	
52	A-7081-905-A	LENS ASSY, VF	
53	3-946-203-01	HOLDER, CRT	
54	3-946-205-01	PACKING, CRT	
55	3-703-848-01	LABEL (N), SUB CAUTION	
56	3-946-204-01	COVER, CRT	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
58	A-7063-019-A	VF-44 BOARD, COMPLETE	
59	3-946-202-01	JOINT, EVF	
60	X-3941-318-1	CABINET (L) ASSY, EVF (FX310)	
60	X-3941-669-1	CABINET (L) ASSY, EVF (FX311)	
61	3-713-790-31	SCREW (M2X8), TAPPING, P3	
62	A-7081-897-A	HOLDER BLOCK ASSY, FINDER	
63	3-946-212-01	EYE CUP	
64	3-719-381-01	SCREW (M2X4)	
* 65	3-948-348-01	LABEL, MODEL NUMBER (FX310)	
* 65	3-948-480-01	LABEL, MODEL NUMBER (FX311)	
66	X-3941-743-1	CABINET (R) ASSY (FX310:US)	
66	X-3941-752-1	CABINET (R) ASSY (FX310:Canadian)	
66	X-3941-779-1	CABINET (R) ASSY (FX311)	
67	3-703-845-01	LABEL (N) (U/C), MAIN CAUTION	
68	3-946-256-01	CAP, POWER (FX310)	
68	3-946-256-11	CAP, POWER (FX311)	
69	3-946-246-01	BUTTON, BATTERY RELEASE (FX310)	
69	3-946-246-11	BUTTON, BATTERY RELEASE (FX311)	
70	3-946-251-01	BUTTON, ON/OFF	
71	3-946-248-01	BUTTON, POWER	
72	3-946-253-01	RING, TILT	
73	3-946-252-01	SLEEVE, EVF	
74	3-946-250-01	CLAW, BATTERY LOCK	
75	3-669-480-21	+ PTPWH 2	
* 76	3-704-367-01	LABEL (FX310:US/FX311)	
77	3-946-186-01	PUSH BUTTON, POWER	
78	3-303-973-00	SPRING, COMPRESSION	
79	3-946-249-01	PLATE, FUNCTION, POWER	
* 80	3-704-256-01	LABEL, CAUTION (FX310:US/FX311)	
81	3-946-255-01	SPRING, LEAF, TILT	
82	3-946-254-01	PLATE, LOCK, TILT	
83	3-947-315-01	PLATE, FIXED, CABINET	
84	3-713-790-01	SCREW (M2X5), TAPPING, P3	
85	3-948-094-01	SCREW EVF (P2X9)	
86	3-740-546-21	SCREW (M2X9)	
87	A-7071-617-A	CK-61 BOARD, COMPLETE	
88	3-948-339-01	SCREW (BTP) (2X5), HEAD	
89	3-946-199-01	RETAINER, DK	
90	1-644-533-11	DK-24 BOARD	
91	3-946-198-01	RETAINER, PK	
92	A-7071-619-A	PK-35 BOARD, COMPLETE	
⚠W502	1-526-978-51	SOCKET ASSY, CRT	
W561	1-690-602-11	CABLE, FLAT (FFC-23) 16P	
W564	1-642-188-11	FP-510 FLEXIBLE BOARD	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	

5-3. MAIN BOARD ASSEMBLY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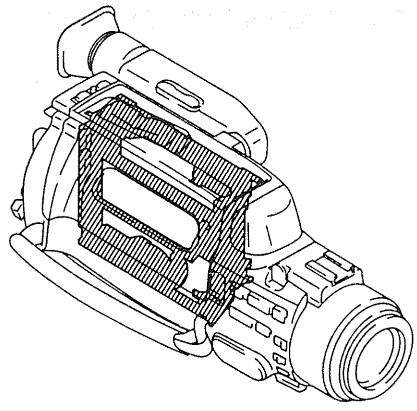
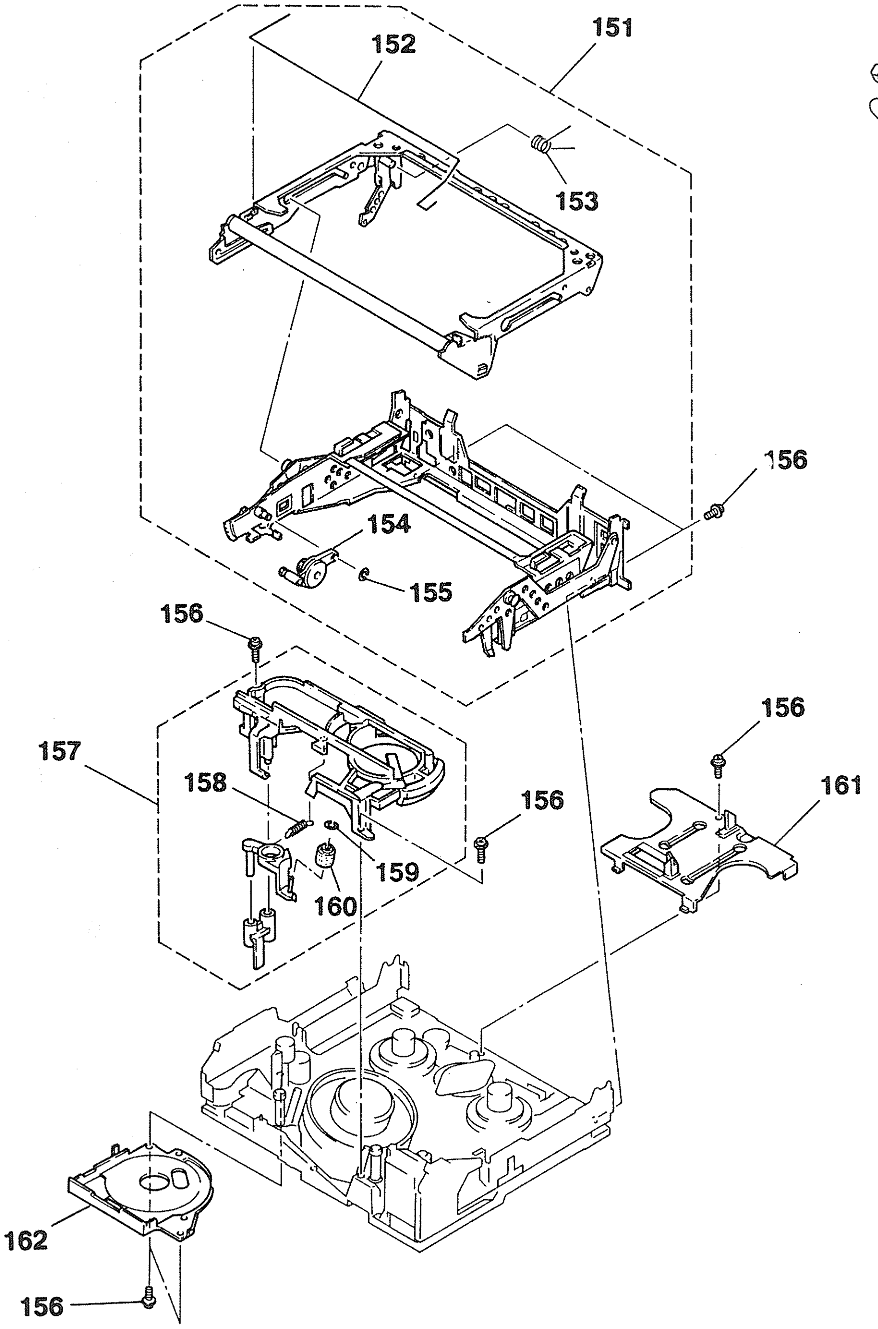
Ref. No.	Part No.	Description	Remark
* 101	3-946-183-01	CASE (MAIN), SHIELD, PS	
102	A-7063-196-A	PS-308 BOARD, COMPLETE	
* 103	X-3941-499-1	SHIELD (LID) ASSY, PS	
104	X-3941-320-1	LID ASSY, LS (FX310)	
104	X-3941-668-1	LID ASSY, LS (FX311)	
105	1-692-025-11	SWITCH, PUSH	
106	3-948-339-01	SCREW (BTP) (2X5), HEAD	
107	1-643-555-11	FP-558 FLEXIBLE BOARD	
108	3-719-381-01	SCREW (M2X4)	
109	A-7081-889-A	HOLDER (R) ASSY, CS	
110	3-718-233-01	NUT, PLATE	
111	A-7081-888-A	HOLDER (F) ASSY, CS	
112	3-946-175-01	HOLDER (B), CS	
113	X-3941-522-1	PLATE ASSY, SHIELD, DRUM	
114	A-7063-198-A	SL-28 BOARD, COMPLETE	
* 115	3-947-660-01	INSULATOR, SL	
116	1-642-187-11	FP-426 FLEXIBLE BOARD	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
118	A-7063-194-A	CS-37 BOARD, COMPLETE	
* 119	3-946-179-01	CASE (MAIN), SHIELD, FE	
* 120	3-946-177-01	CASE (MAIN), SHIELD, RP	
* 121	X-3941-498-1	SHIELD (LID) ASSY, CAMERA	
* 122	3-946-180-01	CASE (LID), SHIELD, FE	
* 123	3-946-178-01	CASE (LID), SHIELD, RP	
* 124	X-3941-314-1	SHIELD ASSY, CAMERA	
125	A-7063-195-A	VA-77 BOARD, COMPLETE	
* 126	3-946-182-01	CASE (LID), SHIELD, VA	
* 127	3-946-181-01	CASE (MAIN), SHIELD, VA	
128	3-947-268-01	SCREW (P TIGHT) (2), TAPPING	
129	A-7063-200-A	CD-96 BOARD, COMPLETE	
130	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
131	3-946-857-01	RUBBER (S), SEAL	
132	1-547-558-21	FILTER BLOCK, OPTICAL	
133	1-547-541-11	LENS, ZOOM (VCL-6110WB)	
134	3-946-223-01	HOLDER (C), LENS	
135	3-946-224-01	SHEET METAL, TRIPOD	
IC901	A-7030-311-A	CCD BLOCK ASSY (AUTO) (CCD IMAGER)	
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

5-4. CASSETTE COMPARTMENT ASSEMBLY

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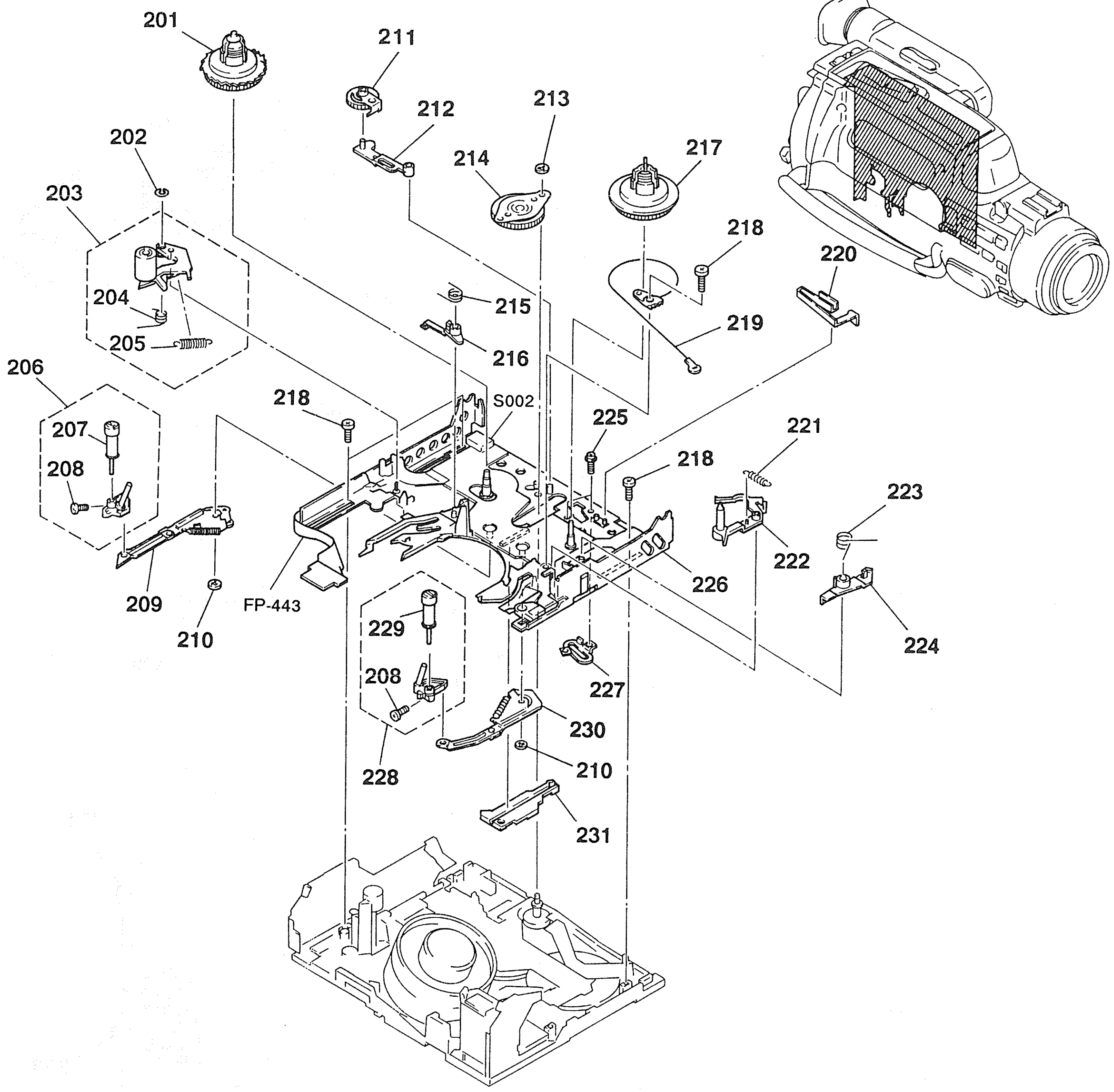
Ref. No.	Part No.	Description	Remark
151	A-7040-312-A	CASSETTE COMPARTMENT BLOCKASSY	
152	3-945-773-01	BAR, TORSION	
153	3-945-771-01	SPRING, TORSION	
154	X-3941-287-1	DAMPER ASSY	
155	3-315-384-31	WASHER, STOPPER	
156	3-947-503-01	SCREW (M1.4X2.5)	
157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
158	3-945-760-01	SPRING, TENSION	
159	3-321-393-01	WASHER, STOPPER	
160	X-3726-817-3	ROLLER ASSY, HC	
161	X-3941-280-1	RETAINER ASSY, GOOSENECK	
162	3-945-733-01	COVER, CAPSTAN	

5-5. LS CHASSIS ASSEMBLY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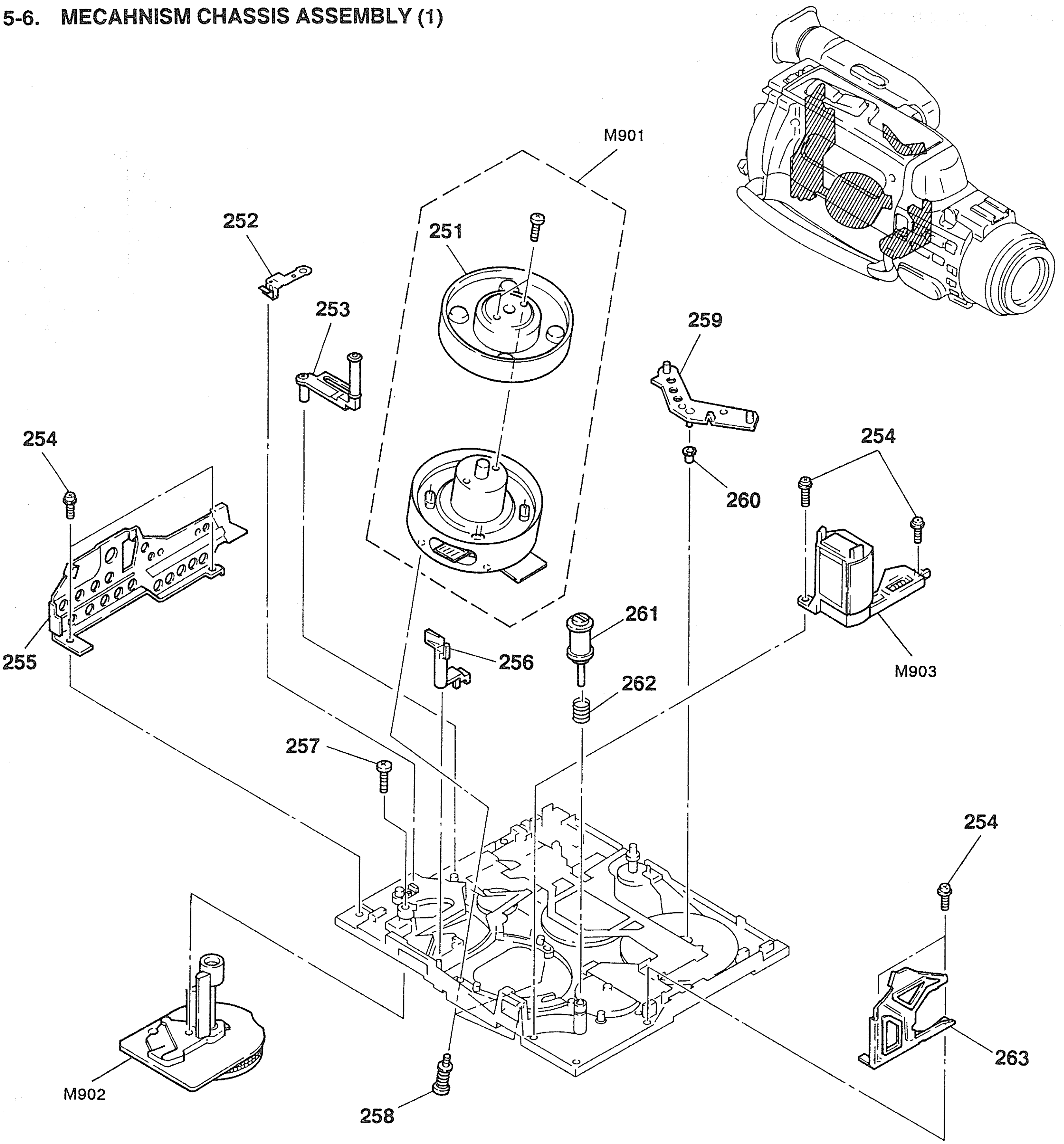
Ref. No.	Part No.	Description	Remark
201	X-3941-274-1	TABLE ASSY, REEL, T	
202	3-331-007-21	WASHER	
203	X-3941-271-1	ARM ASSY, PINCH	
204	3-945-743-01	SPRING, TORSION	
205	3-945-783-01	SPRING, TENSION	
206	A-7040-307-A	GUIDE (BASE) (T) BLOCK ASSY	
207	X-3941-424-1	ROLLER ASSY, TG6	
208	3-947-504-01	SCREW (M1.2X2)	
209	X-3941-267-1	ARM (T) ASSY, GUIDE	
210	3-669-465-00	WASHER (1.5), STOPPER	
211	X-3941-273-1	SOFT ASSY, T	
212	3-945-753-01	ARM, T SOFT	
213	3-726-829-01	WASHER, STOPPER	
214	X-3941-279-1	GEAR ASSY, GOOSENECK	
215	3-945-755-01	SPRING, TORSION	
216	3-945-754-01	CLAW, T HARD	
217	X-3941-275-1	TABLE ASSY, REEL, S	
218	3-945-756-01	SCREW (M1.4X3)	
219	X-3941-277-1	STRING BLOCK ASSY	
220	3-945-801-01	BRAKE, S SOFT	
221	3-947-170-01	SPRING, TENSION	
222	X-3941-276-1	TG1 ASSY	
223	3-945-752-01	SPRING, TORSION	
224	3-945-799-01	BRAKE, S HARD	
225	3-947-503-01	SCREW (M1.4X2.5)	
226	X-3941-265-1	CHASSIS ASSY, LS	
227	3-945-784-01	PLATE, CAM, LS	
228	A-7040-306-A	GUIDE (BASE) (S) BLOCK ASSY	
229	X-3941-269-1	ROLLER ASSY, TG3	
230	X-3941-266-1	ARM (S) ASSY, GUIDE	
231	3-945-837-01	SLIDER, GL	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	

5-6. MECAHNISM CHASSIS ASSEMBLY (1)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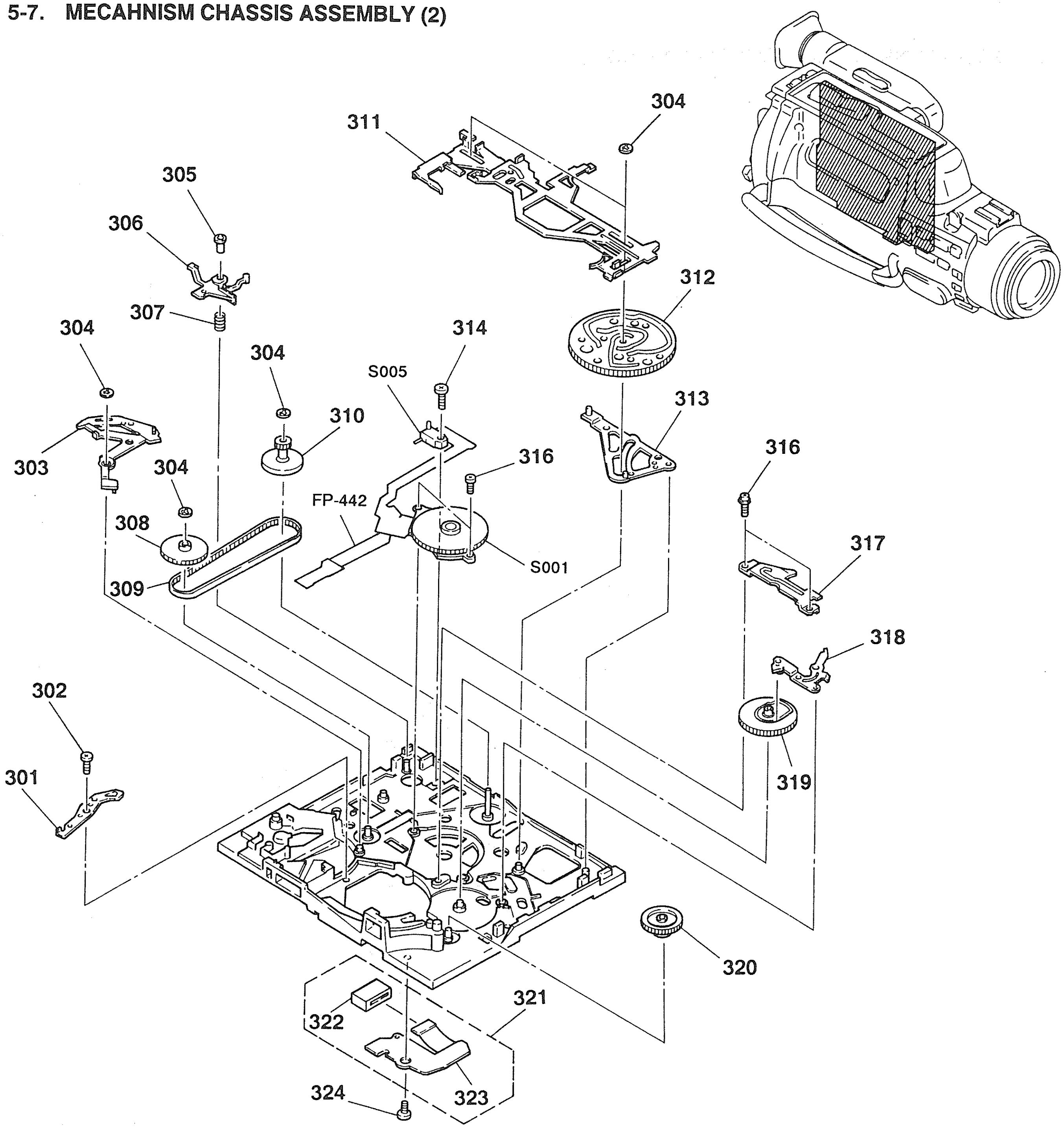
Ref. No.	Part No.	Description	Remark
251	A-7049-559-A	DRUM ASSY, UPPER (DGR-0A2-R)	
252	3-945-822-01	SPRING, LEAF, TG7 ARM	
253	A-7040-305-A	ARM BLOCK ASSY, TG7	
254	3-947-503-01	SCREW (M1.4X2.5)	
255	X-3941-255-1	PLATE (T) ASSY, SIDE	
256	3-945-735-01	ARM, HC CONVERSION	
257	3-713-786-71	SCREW (M2X5)	
258	X-3941-383-1	SCREW ASSY, FITTING	
259	3-945-701-01	ARM, LS	

Ref. No.	Part No.	Description	Remark
260	3-945-702-01	ROLLER, LS	
261	X-3941-262-1	ROLLER ASSY, TG2	
262	3-945-774-01	SPRING, COMPRESSION	
263	3-945-691-01	PLATE (S), SIDE	
M901	A-7048-625-A	DRUM ASSY (DGH-0A2A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-7. MECAHNISM CHASSIS ASSEMBLY (2)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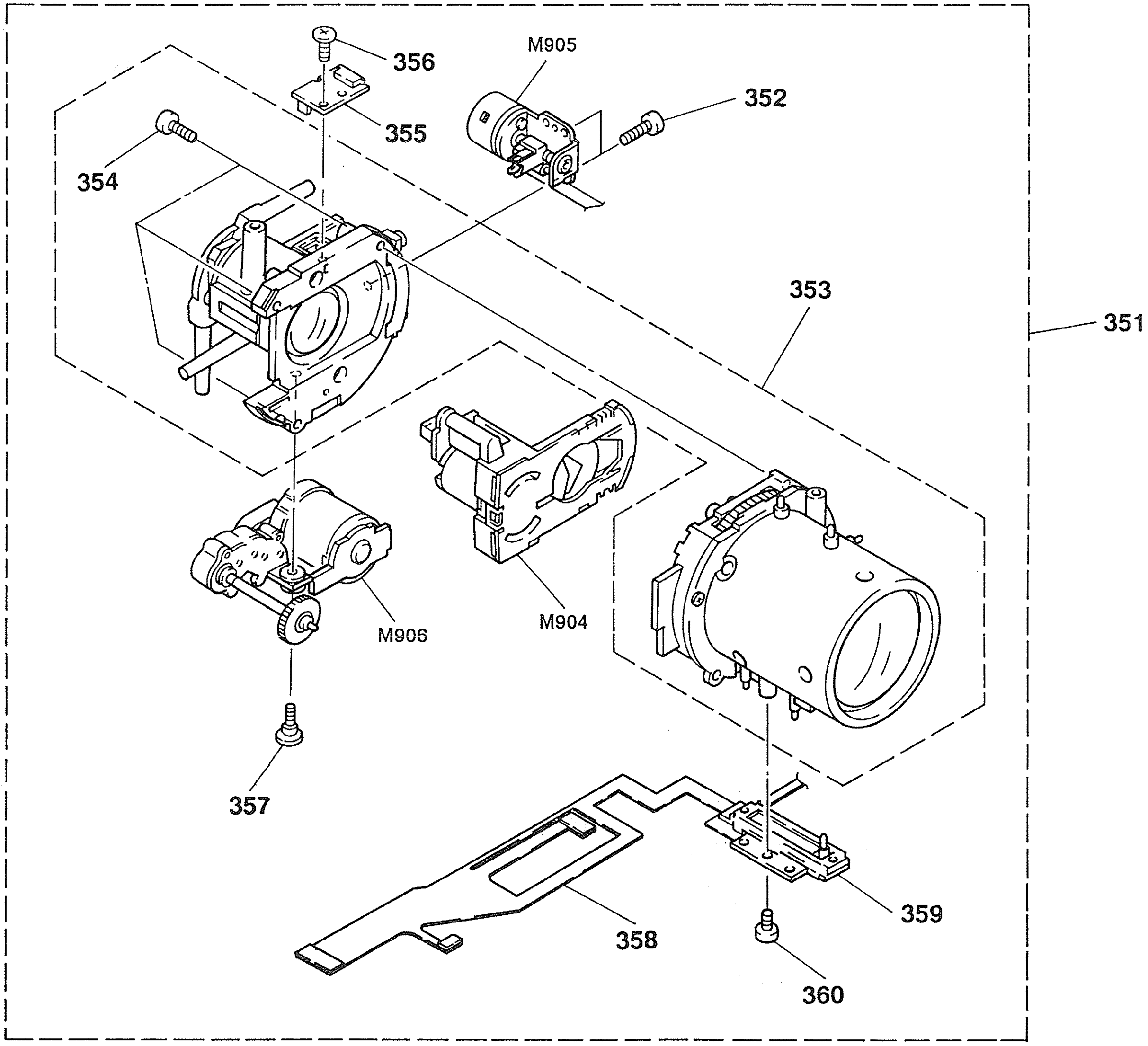
Ref. No.	Part No.	Description	Remark
301	3-945-734-01	ARM, HC DRIVING	
302	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
303	X-3941-259-1	ARM ASSY, PINCH PRESS	
304	3-726-829-01	WASHER, STOPPER	
305	3-945-730-01	SLEEVE, EJECT	
306	3-945-706-01	LEVER, EJECT	
307	3-945-729-01	SPRING, COMPRESSION	
308	X-3941-256-1	GEAR ASSY, CHANGE	
309	3-944-539-01	BELT, RELAY	
310	3-945-695-01	PULLEY, RELAY	
311	X-3941-260-1	SLIDER ASSY, M	
312	3-945-696-01	CAM	

Ref. No.	Part No.	Description	Remark
313	X-3941-258-1	ARM ASSY, GL	
314	3-713-786-71	SCREW (M2X5)	
316	3-947-503-01	SCREW (M1.4X2.5)	
317	3-945-722-01	RETAINER, GEAR	
318	X-3941-257-1	ARM ASSY, FF	
319	3-945-697-01	GEAR (B), L	
320	3-945-700-01	GEAR (A), L	
321	A-7040-311-A	FP-444 ASSY	
322	1-691-254-12	CONNECTOR, TRANSLATION 10P	
323	1-641-643-12	FP-444 FLEXIBLE BOARD	
324	3-945-756-01	SCREW (M1.4X3)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH (C DOWN)	

5-8. ZOOM LENS ASSEMBLY (VCL-6110WB)



Ref. No.	Part No.	Description	Remark
351	1-547-541-11	LENS, ZOOM (VCL-6110WB)	
352	3-708-390-01	SCREW, FITTING, FOCUS MOTOR	
353	3-708-462-01	LENS ASSY (B)	
354	3-708-386-01	SCREW, DOCKING	
355	3-708-331-01	SENSOR ASSY, RESET	
356	3-708-392-01	SCREW, FITTING, FI BOARD	
357	3-707-501-01	SCREW, (Z) MOTOR FITTING	

Ref. No.	Part No.	Description	Remark
358	3-708-395-01	CHASSIS, RELAY FLEXIBLE	
359	3-708-393-01	POTENTIAL, ZOOM	
360	3-708-394-01	SCREW, FITTING ZOOM POTENTIAL	
M904	3-708-385-01	IRIS ASSY	
M905	3-708-389-01	MOTOR ASSY, FOCUS	
M906	3-708-387-01	MOTOR ASSY, ZOOM	

SECTION 6
ELECTRICAL PARTS LIST

CD-96 **CK-61**

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Hardware (# mark) list is given in the last of this parts list.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description	Remark
	A-7063-200-A	CD-96 BOARD, COMPLETE ********************** (Ref, No 1,000 Series)	
		(CAPACITOR)	
C901	1-135-214-21	TANTAL. CHIP 4.7uF 20% 20V	
C902	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C903	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C904	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C905	1-162-637-11	CERAMIC CHIP 0.47uF 16V	
C906	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C907	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C908	1-128-007-11	ELECT CHIP 2.2uF 20% 35V	
C909	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C910	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C911	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
		(CONNECTOR)	
CN901	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P	
CN902	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	
		(DIODE)	
D901	8-719-820-05	DIODE 1SS181	
D903	8-719-820-05	DIODE 1SS181	
D904	8-719-800-76	DIODE 1SS226	
		(COIL)	
L901	1-412-032-11	INDUCTOR CHIP 100uH	
		(TRANSISTOR)	
Q901	8-729-010-75	TRANSISTOR MSC4116-B/C	
Q902	8-729-402-13	TRANSISTOR XN1501-TX	
Q903	8-729-232-86	TRANSISTOR 2SK1875	
		(RESISTOR)	
R901	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R902	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R903	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R904	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R905	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R906	1-216-819-11	METAL CHIP 680 5% 1/16W	
R907	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R908	1-216-850-11	METAL CHIP 270K 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R909	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R910	1-216-809-11	METAL CHIP 100 5% 1/16W	
R911	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R914	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R915	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R916	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R917	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R921	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	

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Ref. No.	Part No.	Description	Remark
	A-7071-617-A	CK-61 BOARD, COMPLETE ********************* (Ref, No 6,000 Series)	
		(CONNECTOR)	
* CN562	1-580-756-21	PIN, CONNECTOR 7P	
		(DIODE)	
D560	8-719-820-05	DIODE 1SS181	
D561	8-719-404-46	DIODE MA110	
D562	8-719-110-03	DIODE RD7.5ES-B2	
D563	8-719-110-03	DIODE RD7.5ES-B2	
D564	8-719-110-03	DIODE RD7.5ES-B2	
D565	8-719-110-03	DIODE RD7.5ES-B2	
		(COIL)	
L560	1-412-028-11	INDUCTOR CHIP 4.7uH	
		(RESISTOR)	
R561	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R562	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R563	1-216-857-11	METAL CHIP 1M 5% 1/16W	
		(SWITCH)	
S560	1-692-024-11	SWITCH, ROTARY (PROGRAM AE)	
S564	1-572-938-21	SWITCH, TACTIL (DATE)	
S565	1-572-938-21	SWITCH, TACTIL (TIME)	
S566	1-572-938-21	SWITCH, TACTIL (AGE/EVENT)	
S567	1-692-111-11	SWITCH, KEY BOARD (BACK LIGHT)	
S568	1-692-111-11	SWITCH, KEY BOARD (FADER)	

Ref. No.	Part No.	Description				Remark
		(FLAT CABLE)				
W561	1-690-602-11	CABLE, FLAT (FFC-23) 16P				

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Ref. No.	Part No.	Description				Remark
	A-7063-194-A	CS-37 BOARD, COMPLETE				
		**********************				
		(Ref,No 1,000 Series)				
	X-3941-498-1	CASE (LID), SHIELD, CAMERA				
*	3-946-177-01	CASE (MAIN), SHIELD, RP				
*	3-946-178-01	CASE (LID), SHIELD, RP				
*	3-946-179-01	CASE (MAIN), SHIELD, FE				
*	3-946-180-01	CASE (LID), SHIELD, FE				
		(CAPACITOR)				
C001	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C002	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C003	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C004	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C005	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C006	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C007	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C008	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C009	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C010	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C011	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C012	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C013	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C014	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C016	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C017	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C018	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C019	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C020	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C021	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C022	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C023	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C024	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C025	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C026	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C041	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C042	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C043	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C044	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C045	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	
C046	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C501	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C502	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C503	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C504	1-162-995-11	CERAMIC CHIP	0.022uF		50V	

Ref. No.	Part No.	Description				Remark
C505	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C506	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C507	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C508	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C509	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C510	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C511	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C512	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V	
C513	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C514	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C515	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C517	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C518	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C519	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C520	1-164-222-11	CERAMIC CHIP	0.22uF		25V	
C521	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C522	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C523	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C524	1-163-035-00	CERAMIC CHIP	0.047uF		50V	
C525	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C526	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C527	1-163-035-00	CERAMIC CHIP	0.047uF		50V	
C528	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C529	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C530	1-162-911-11	CERAMIC CHIP	6PF	0.5PF	50V	
C531	1-162-916-11	CERAMIC CHIP	12PF	5%	50V	
C532	1-162-909-11	CERAMIC CHIP	4PF	0.25PF	50V	
C534	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C535	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C536	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C538	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C540	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C541	1-126-204-11	ELECT CHIP	47uF	20%	16V	
C542	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C543	1-164-107-11	CERAMIC CHIP	0.15uF	10%	16V	
C544	1-164-107-11	CERAMIC CHIP	0.15uF	10%	16V	
C546	1-128-008-11	ELECT CHIP	3.3uF	20%	35V	
C547	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C548	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C549	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V	
C550	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V	
C551	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V	
C552	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C553	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C554	1-164-222-11	CERAMIC CHIP	0.22uF		25V	
C555	1-164-222-11	CERAMIC CHIP	0.22uF		25V	
C556	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C558	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C559	1-126-397-11	ELECT	33uF	20%	25V	
C560	1-128-004-11	ELECT CHIP	10uF	20%	16V	

Ref. No.	Part No.	Description				Remark
C561	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C562	1-162-995-11	CERAMIC CHIP	0.022uF		50V	
C563	1-162-971-11	CERAMIC CHIP	0.001uF		50V	
C564	1-162-920-11	CERAMIC CHIP	27PF	5%	50V	
C565	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C566	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C567	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C568	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C569	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C570	1-162-962-11	CERAMIC CHIP	470PF	10%	50V	
C571	1-162-961-11	CERAMIC CHIP	330PF	10%	50V	
C572	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C573	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C574	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C575	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C576	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C577	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C578	1-164-222-11	CERAMIC CHIP	0.22uF		25V	
C579	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C580	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C582	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C583	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C584	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C586	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	
C587	1-162-921-11	CERAMIC CHIP	33PF	5%	50V	
C588	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C589	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C590	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C591	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C592	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C593	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C594	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C595	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C701	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V	
C702	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C703	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C705	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C707	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C708	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C709	1-164-346-11	CERAMIC CHIP	1uF		16V	
C710	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C711	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C712	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C713	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C714	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C718	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C719	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C721	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C724	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C725	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	

Ref. No.	Part No.	Description				Remark
C726	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C729	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C733	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C736	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C737	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C738	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C739	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C741	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C743	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C745	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C749	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C752	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C753	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C754	1-162-946-11	CERAMIC CHIP	27PF	5%	50V	
C756	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C801	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
C802	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C803	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C804	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C805	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C806	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C807	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C808	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C809	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C810	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C811	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C813	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C814	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C815	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C816	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C817	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C818	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C819	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C820	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C821	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C823	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C826	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C828	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C831	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C832	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C833	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C834	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	
C835	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C836	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C837	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C838	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C839	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C840	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C851	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C852	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	

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Ref. No.	Part No.	Description				Remark
C853	1-162-638-11	CERAMIC CHIP	1uF		16V	
C854	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C855	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C856	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C857	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C858	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C859	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C861	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C862	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C863	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C864	1-162-638-11	CERAMIC CHIP	1uF		16V	
C865	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C866	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C868	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C869	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C870	1-164-173-11	CERAMIC CHIP	0.0039uF	10%	50V	
C872	1-162-638-11	CERAMIC CHIP	1uF		16V	
C875	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V	
		(CONNECTOR)				
CN001	1-569-775-21	PIN, CONNECTOR 5P				
CN002	1-691-492-21	CONNECTOR, FFC/FPC 13P				
CN501	1-691-520-21	CONNECTOR, BOARD TO BOARD 48P				
CN502	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P				
CN503	1-691-530-11	CONNECTOR, BOARD TO BOARD 40P				
CN504	1-691-524-11	CONNECTOR, BOARD TO BOARD 20P				
CN505	1-691-495-21	CONNECTOR, FFC/FPC 16P				
CN507	1-691-494-21	CONNECTOR, FFC/FPC 15P				
CN701	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P				
CN801	1-691-475-21	CONNECTOR, BOARD TO BOARD 18P				
CN851	1-573-361-11	CONNECTOR, FFC/FPC 21P				
CN852	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P				
		(TRIMMER)				
CT801	1-141-356-11	CAP, ADJ 6PF				
		(DIODE)				
D501	8-719-421-27	DIODE	MA728			
D502	8-719-404-46	DIODE	MA110			
D503	8-719-110-03	DIODE	RD7.5ES-B2			
D504	8-719-941-86	DIODE	DAN202U			
D507	8-719-404-46	DIODE	MA110			
		(FILTER)				
FL701	1-406-452-11	COIL, OSC				
		(IC)				
IC001	8-752-033-38	IC	CXA1202R			
IC501	8-759-058-96	IC	TB1206F			
IC502	8-759-999-02	IC	TL1596CDB			

Ref. No.	Part No.	Description		Remark
IC503	8-752-836-46	IC	CXP80624-283Q	
IC505	8-759-990-55	IC	CXA8006M	
IC506	8-759-074-41	IC	uPD75316GF-246-3B9	
IC507	8-759-511-22	IC	CXA1448N	
IC508	8-759-512-69	IC	S-81350HG-KD	
IC509	8-759-145-63	IC	uPD7564G-540	
IC510	8-759-039-01	IC	MPC1720M	
IC511	8-759-044-78	IC	AK6420F-SGX2060	
IC701	8-759-031-58	IC	SC7SU04F	
IC702	8-759-635-27	IC	M62352GP	
IC703	8-759-069-29	IC	uPD6456GS-618-E2	
IC704	8-752-348-92	IC	CXD2101AR	
IC705	8-759-063-18	IC	CXD2103AR-T6	
IC706	8-752-337-36	IC	CXD2104N	
IC707	8-752-344-93	IC	CXD2100AQ	
IC707	8-752-344-53	IC	CXD2100Q	
IC709	8-752-836-09	IC	CXP80624-278Q	
IC712	8-759-044-78	IC	AK6420F	
IC801	8-752-337-34	IC	CXD1257R	
IC802	8-752-056-39	IC	CXA1507BR	
IC803	8-752-053-26	IC	CXA1399Q	
IC804	8-752-327-48	IC	CXD1250N	
IC805	8-752-054-61	IC	CXA1390AR	
IC851	8-759-701-24	IC	NJM3414M	
IC852	8-759-998-96	IC	LM324D	
IC853	8-759-038-81	IC	MPC1724M	
IC854	8-759-823-51	IC	LB1830M	
IC855	8-759-998-98	IC	LM358D	
		(COIL)		
L001	1-412-033-11	INDUCTOR CHIP	220uH	
L002	1-412-033-11	INDUCTOR CHIP	220uH	
L003	1-412-033-11	INDUCTOR CHIP	220uH	
L004	1-412-029-11	INDUCTOR CHIP	10uH	
L041	1-412-033-11	INDUCTOR CHIP	220uH	
L042	1-410-381-11	INDUCTOR CHIP	10uH	
L501	1-412-029-11	INDUCTOR CHIP	10uH	
L502	1-412-029-11	INDUCTOR CHIP	10uH	
L503	1-412-028-11	INDUCTOR CHIP	4.7uH	
L504	1-412-028-11	INDUCTOR CHIP	4.7uH	
L506	1-412-029-11	INDUCTOR CHIP	10uH	
L701	1-412-006-31	INDUCTOR CHIP	10uH	
L703	1-412-006-31	INDUCTOR CHIP	10uH	
L704	1-412-006-31	INDUCTOR CHIP	10uH	
L706	1-412-029-11	INDUCTOR CHIP	10uH	
L714	1-412-011-31	INDUCTOR CHIP	27uH	
L715	1-412-029-11	INDUCTOR CHIP	10uH	
L716	1-412-026-11	INDUCTOR CHIP	1uH	
L717	1-412-029-11	INDUCTOR CHIP	10uH	
L719	1-412-006-31	INDUCTOR CHIP	10uH	

Ref. No.	Part No.	Description				Remark
L722	1-412-006-31	INDUCTOR CHIP	10uH			
L723	1-410-391-11	INDUCTOR CHIP	68uH			
L730	1-412-026-11	INDUCTOR CHIP	1uH			
L731	1-412-026-11	INDUCTOR CHIP	1uH			
L732	1-412-026-11	INDUCTOR CHIP	1uH			
L733	1-412-979-21	INDUCTOR	1uH			
L734	1-412-979-21	INDUCTOR	1uH			
L801	1-412-029-11	INDUCTOR CHIP	10uH			
L802	1-412-006-31	INDUCTOR CHIP	10uH			
L803	1-412-029-11	INDUCTOR CHIP	10uH			
L804	1-412-029-11	INDUCTOR CHIP	10uH			
L851	1-412-029-11	INDUCTOR CHIP	10uH			
L853	1-412-029-11	INDUCTOR CHIP	10uH			
		(IC LINK)				
⚠PS501	1-576-123-21	RINK, IC				
		(TRANSISTOR)				
Q002	8-729-010-75	TRANSISTOR	MSC4116-B/C			
Q003	8-729-905-12	TRANSISTOR	DTA144EU			
Q041	8-729-010-60	TRANSISTOR	MSA1586-BC			
Q042	8-729-920-99	TRANSISTOR	DTA114EU			
Q043	8-729-216-22	TRANSISTOR	2SA1162-G			
Q501	8-729-907-00	TRANSISTOR	DTC114EU			
Q502	8-729-402-78	TRANSISTOR	XN6401			
Q503	8-729-010-75	TRANSISTOR	MSC4116-B/C			
Q505	8-729-010-60	TRANSISTOR	MSA1586-BC			
Q507	8-729-905-12	TRANSISTOR	DTA144EU			
Q509	8-729-822-84	TRANSISTOR	2SB1202FAST			
Q510	8-729-402-81	TRANSISTOR	XN4501			
Q511	8-729-402-81	TRANSISTOR	XN4501			
Q702	8-729-402-84	TRANSISTOR	XN4601			
Q703	8-729-010-60	TRANSISTOR	MSA1586-BC			
Q704	8-729-010-60	TRANSISTOR	MSA1586-BC			
Q707	8-729-010-75	TRANSISTOR	MSC4116-B/C			
Q708	8-729-920-99	TRANSISTOR	DTA114EU			
Q709	8-729-905-61	TRANSISTOR	DTC124EU			
Q801	8-729-010-75	TRANSISTOR	MSC4116-B/C			
Q802	8-729-403-27	TRANSISTOR	XN4401			
Q851	8-729-010-75	TRANSISTOR	MSC4116-B/C			
Q853	8-729-403-27	TRANSISTOR	XN4401			
		(RESISTOR)				
R001	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R003	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R004	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R005	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R006	1-216-791-11	METAL CHIP	3.3	5%	1/16W	
R007	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R008	1-216-838-11	METAL CHIP	27K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R009	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R011	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R012	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R013	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R014	1-216-791-11	METAL CHIP	3.3	5%	1/16W	
R015	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R016	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R017	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R018	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R019	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R020	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R021	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R022	1-216-864-11	METAL CHIP	0	5%	1/16W	
R023	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R024	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R026	1-216-817-11	METAL CHIP	470	5%	1/16W	
R041	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R042	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R043	1-216-814-11	METAL CHIP	270	5%	1/16W	
R044	1-216-813-11	METAL CHIP	220	5%	1/16W	
R045	1-216-803-11	METAL CHIP	33	5%	1/16W	
R046	1-216-806-11	METAL GLAZE	56	5%	1/16W	
R047	1-216-818-11	METAL CHIP	560	5%	1/16W	
R048	1-216-864-11	METAL CHIP	0	5%	1/16W	
R501	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R502	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R503	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R504	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R505	1-216-817-11	METAL CHIP	470	5%	1/16W	
R506	1-216-852-11	METAL CHIP	390K	5%	1/16W	
R507	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R508	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R509	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R510	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R511	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R512	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R513	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R514	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R515	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R516	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R517	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R518	1-216-809-11	METAL CHIP	100	5%	1/16W	
R520	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R521	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R522	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R523	1-216-864-11	METAL CHIP	0	5%	1/16W	
R524	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R526	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R532	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R533	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description				Remark
R534	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R536	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R537	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R538	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R539	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R540	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R541	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R543	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R544	1-216-815-11	METAL CHIP	330	5%	1/16W	
R545	1-216-039-00	METAL CHIP	390	5%	1/10W	
R547	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R548	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R549	1-217-671-11	METAL CHIP	1	5%	1/10W	
R550	1-217-671-11	METAL CHIP	1	5%	1/10W	
R551	1-217-671-11	METAL CHIP	1	5%	1/10W	
R552	1-217-671-11	METAL CHIP	1	5%	1/10W	
R553	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R555	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R556	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R557	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R558	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R559	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R560	1-216-864-11	METAL CHIP	0	5%	1/16W	
R562	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R563	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R564	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R565	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R566	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R567	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R568	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R569	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R570	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R571	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R572	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R573	1-216-861-11	METAL CHIP	2.2M	5%	1/16W	
R574	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R575	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R577	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R578	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R579	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R580	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R584	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R585	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R586	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R587	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R589	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R590	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R591	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R592	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R594	1-216-833-11	METAL CHIP	10K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R600	1-216-809-11	METAL CHIP	100	5%	1/16W	
R601	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R603	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R607	1-216-295-00	METAL CHIP	0	5%	1/10W	
R608	1-216-295-00	METAL CHIP	0	5%	1/10W	
R609	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R611	1-216-864-11	METAL CHIP	0	5%	1/16W	
R701	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R702	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R703	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R704	1-216-815-11	METAL CHIP	330	5%	1/16W	
R705	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R707	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R708	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R709	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R711	1-216-864-11	METAL CHIP	0	5%	1/16W	
R712	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R713	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R714	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R715	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R718	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R720	1-216-864-11	METAL CHIP	0	5%	1/16W	
R722	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R724	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R727	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R728	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R729	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R730	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R731	1-216-295-00	METAL CHIP	0	5%	1/10W	
R732	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R733	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R734	1-216-817-11	METAL CHIP	470	5%	1/16W	
R735	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R736	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R737	1-216-813-11	METAL CHIP	220	5%	1/16W	
R738	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R739	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R740	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R741	1-216-864-11	METAL CHIP	0	5%	1/16W	
R742	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R745	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R747	1-216-864-11	METAL CHIP	0	5%	1/16W	
R749	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R750	1-216-864-11	METAL CHIP	0	5%	1/16W	
R752	1-216-816-11	METAL CHIP	390	5%	1/16W	
R753	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R754	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R755	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R756	1-216-864-11	METAL CHIP	0	5%	1/16W	
R757	1-216-864-11	METAL CHIP	0	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R758	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R759	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R760	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R763	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R764	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R765	1-216-814-11	METAL CHIP	270	5%	1/16W	
R766	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R767	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R769	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R770	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R772	1-216-864-11	METAL CHIP	0	5%	1/16W	
R773	1-216-864-11	METAL CHIP	0	5%	1/16W	
R774	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R775	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R776	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R778	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R783	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R784	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R785	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R788	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R793	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R794	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R795	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R796	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R797	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R802	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R804	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R805	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R808	1-216-801-11	METAL CHIP	22	5%	1/16W	
R810	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R812	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R813	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R814	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R815	1-216-818-11	METAL CHIP	560	5%	1/16W	
R816	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R819	1-216-805-11	METAL CHIP	47	5%	1/16W	
R823	1-218-876-11	METAL CHIP	16K	0.50%	1/16W	
R825	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R826	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R828	1-218-847-11	METAL CHIP	1K	0.50%	1/16W	
R836	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W	
R851	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R852	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R853	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R854	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R855	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R857	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R858	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R859	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R860	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R861	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R862	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R863	1-216-855-11	METAL CHIP	680K	5%	1/16W	
R864	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R865	1-218-879-11	METAL CHIP	22K	0.50%	1/16W	
R866	1-216-820-11	METAL CHIP	820	5%	1/16W	
R867	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R868	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R869	1-218-744-11	METAL CHIP	150K	0.50%	1/16W	
R870	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R871	1-218-871-11	METAL CHIP	10K	0.50%	1/16W	
R872	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R873	1-216-816-11	METAL CHIP	390	5%	1/16W	
R874	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R875	1-216-134-00	METAL CHIP	2.2	5%	1/8W	
R876	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R877	1-218-881-11	METAL CHIP	27K	0.50%	1/16W	
R884	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R885	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	

(CONPOSITION CIRCUIT BLOCK)

Ref. No.	Part No.	Description	Remark
RB501	1-236-412-11	NETWORK, RES 1.0K	
RB502	1-236-424-11	NETWORK, RES 10K	
RB503	1-236-412-11	NETWORK, RES 1.0K	
RB504	1-236-442-11	NETWORK, RES 330K	
RB505	1-236-420-11	NETWORK, RES 4.7K	
RB506	1-236-424-11	NETWORK, RES 10K	
RB509	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE) 1K	
RB510	1-236-432-11	NETWORK, RES 47K	
RB512	1-236-424-11	NETWORK, RES 10K	
RB513	1-236-432-11	NETWORK, RES 47K	
RB516	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE) 1K	
RB517	1-236-436-11	NETWORK, RES 100K	
RB518	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE) 100K	
RB519	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE) 100K	
RB520	1-236-412-11	NETWORK, RES 1.0K	
RB522	1-236-424-11	NETWORK, RES 10K	
RB523	1-236-424-11	NETWORK, RES 10K	
RB526	1-236-408-11	NETWORK, RES 470	
RB527	1-236-432-11	NETWORK, RES 47K	
RB528	1-236-432-11	NETWORK, RES 47K	
RB529	1-236-420-11	NETWORK, RES 4.7K	
RB530	1-236-420-11	NETWORK, RES 4.7K	
RB702	1-236-432-11	NETWORK, RES 47K	
RB705	1-236-416-11	NETWORK, RES 2.2K	
RB708	1-236-416-11	NETWORK, RES 2.2K	
RB709	1-236-416-11	NETWORK, RES 2.2K	
RB710	1-236-412-11	NETWORK, RES 1.0K	
RB711	1-236-412-11	NETWORK, RES 1.0K	

Ref. No.	Part No.	Description	Remark
RB712	1-236-412-11	NETWORK, RES 1.0K	
RB713	1-236-412-11	NETWORK, RES 1.0K	
RB714	1-236-412-11	NETWORK, RES 1.0K	
RB740	1-236-432-11	NETWORK, RES 47K	
		〈 VIBRATOR 〉	
X501	1-579-367-21	VIBRATOR, CRYSTAL 11.89MHz	
X502	1-579-550-11	VIBRATOR, CRYSTAL 32KHz	
X503	1-578-713-21	VIBLATOR, CERAMIC 4.9MHz	
X504	1-579-551-11	VIBRATOR, CERAMIC 700KHz	
X701	1-579-553-11	VIBRATOR 10MHz	
X801	1-579-042-11	VIBRATOR, CRYSTAL 28.6363MHz	

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1-644-533-11 DK-24 BOARD (Ref,No 7,000 Series)
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Ref. No.	Part No.	Description	Remark
		〈 RESISTOR 〉	
R564	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R565	1-216-857-11	METAL CHIP 1M 5% 1/16W	
		〈 SWITCH 〉	
S561	1-572-938-21	SWITCH, TACTIL (COUNTER RESET)	
S562	1-572-938-21	SWITCH, TACTIL (ZERO MEM)	
S563	1-572-938-21	SWITCH, TACTIL (TAPE/BATT CHECK)	
		〈 FLAT CABLE 〉	
W564	1-642-188-11	FP-510 FLEXIBLE BOARD	

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A-7071-615-A FL-53 BOARD, COMPLETE
****
(Ref,No 4,000 Series)

Ref. No.	Part No.	Description	Remark
		〈 SWITCH 〉	
S400	1-692-111-21	SWITCH, KEY BOARD (PUSH FOCUS HOLD)	
		〈 FLAT CABLE 〉	
W410	1-645-261-11	FP-622 FLEXIBLE	

****

A-7063-197-A MA-155 BOARD, COMPLETE
****
(Ref,No 3,000 Series)

Ref. No.	Part No.	Description	Remark
		〈 CAPACITOR 〉	
C400	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C401	1-164-677-11	CERAMIC CHIP 0.033uF 10% 16V	
C402	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C403	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C404	1-162-587-11	CERAMIC CHIP 0.039uF 10% 25V	
C405	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C406	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C407	1-162-638-11	CERAMIC CHIP 1uF 16V	
C410	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C411	1-162-638-11	CERAMIC CHIP 1uF 16V	
C412	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C415	1-162-638-11	CERAMIC CHIP 1uF 16V	
C417	1-164-299-11	CERAMIC CHIP 0.22uF 10% 25V	
		〈 CONNECTOR 〉	
CN400	1-580-057-11	PIN, CONNECTOR 4P	
		〈 DIODE 〉	
D400	8-719-110-03	DIODE RD7.5ES-B2	
D401	8-719-110-03	DIODE RD7.5ES-B2	
		〈 IC 〉	
IC400	8-759-822-37	IC LA7293M-TE-L	
IC401	8-749-923-29	IC RS-20E-T	
		〈 JACK 〉	
J400	1-568-027-11	JACK, SMALL TYPE 1P	
		〈 COIL 〉	
L400	1-410-993-11	INDUCTOR CHIP 1uH	
L401	1-410-993-11	INDUCTOR CHIP 1uH	
		〈 TRANSISTOR 〉	
Q400	8-729-010-60	TRANSISTOR MSA1586-BC	
		〈 RESISTOR 〉	
R400	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R401	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R402	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R403	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R405	1-216-864-11	METAL CHIP 0 5% 1/16W	
R407	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R412	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R414	1-216-864-11	METAL CHIP 0 5% 1/16W	
		〈 FLAT CABLE 〉	
W400	1-690-603-11	CABLE, FLAT (FFC-25) 8P	

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A-7071-614-A PJ-50 BOARD, COMPLETE
****
(Ref,No 9,000 Series)

Ref. No.	Part No.	Description	Remark
		< BUZZER >	
BU550	1-529-107-11	BUZZER, PIEZOELECTRIC	
		< CAPACITOR >	
C550	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C551	1-164-346-11	CERAMIC CHIP 1uF 16V	
C552	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C553	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
		< CONNECTOR >	
CN550	1-691-491-21	CONNECTOR, FFC/FPC 12P	
		< DIODE >	
D550	8-719-404-46	DIODE MA110	
D551	8-719-110-03	DIODE RD7.5ES-B2	
D552	8-719-110-03	DIODE RD7.5ES-B2	
		< SWITCH >	
S550	1-571-275-31	SWITCH, SLIDE (EDIT)	

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A-7071-619-A PK-35 BOARD, COMPLETE
****
(Ref,No 8,000 Series)

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN540	1-691-485-21	CONNECTOR, FFC/FPC 6P	
		< DIODE >	
D540	8-719-820-05	DIODE 1SS181	
		< SWITCH >	
S540	1-572-283-11	SWITCH, SLIDE (POWER)	
S541	1-571-275-31	SWITCH, SLIDE (BEEP)	
S542	1-571-275-31	SWITCH, SLIDE (REMOTE COMMANDER)	

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A-7063-196-A PS-308 BOARD, COMPLETE
****
(Ref,No 3,000 Series)

Ref. No.	Part No.	Description	Remark
		< CAPACITOR >	
C948	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C949	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C950	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C951	1-164-384-11	CERAMIC CHIP 130PF 5% 50V	
C952	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C953	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C954	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C957	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C958	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C959	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C960	1-164-730-11	CERAMIC CHIP 0.0012uF 5% 50V	
C961	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C962	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C963	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C965	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C966	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C968	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C969	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C970	1-162-963-11	CERAMIC CHIP 680PF 10% 50V	
C971	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C972	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C973	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C974	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C975	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C976	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C977	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C978	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C979	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C980	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C981	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C982	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C983	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C984	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C985	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C986	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C987	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C988	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C989	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C990	1-164-346-11	CERAMIC CHIP 1uF 16V	
C991	1-164-346-11	CERAMIC CHIP 1uF 16V	
C992	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C993	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C994	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C995	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C996	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C997	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C998	1-128-530-11	ELECT CHIP 33uF 20% 10V	

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Ref. No.	Part No.	Description	Remark
		(CONNECTOR)	
CN950	1-691-540-11	CONNECTOR, BOARD TO BOARD 40P	
		(DIODE)	
D950	8-719-989-33	DIODE FC806	
D952	8-719-110-03	DIODE RD7.5ES-B2	
D953	8-719-110-03	DIODE RD7.5ES-B2	
D961	8-719-404-46	DIODE MA110	
D962	8-719-110-03	DIODE RD7.5ES-B2	
D963	8-719-110-03	DIODE RD7.5ES-B2	
D964	8-719-404-46	DIODE MA110	
		(FUSE)	
⚠F950	1-532-778-21	FUSE, MICRO (1.6A 125V)	
⚠F951	1-532-778-21	FUSE, MICRO (1.6A 125V)	
		(IC)	
⚠IC950	8-759-060-94	IC MB3785APFV-G-BND-ER	
		(JACK)	
J950	1-537-281-41	TERMINAL BOARD	
J951	1-565-276-21	JACK, ULTRA SMALL 1P	
J952	1-568-027-11	JACK, SMALL TYPE 1P	
		(COIL)	
L950	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L951	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L952	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L953	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L954	1-424-522-21	COIL, CHOKE 10uH	
L955	1-424-522-21	COIL, CHOKE 10uH	
L956	1-424-522-21	COIL, CHOKE 10uH	
L957	1-424-524-21	COIL, CHOKE 47uH	
L958	1-412-034-11	INDUCTOR CHIP 330uH	
L959	1-412-034-11	INDUCTOR CHIP 330uH	
L960	1-412-027-11	INDUCTOR CHIP 2.2uH	
L961	1-412-029-11	INDUCTOR CHIP 10uH	
L962	1-412-029-11	INDUCTOR CHIP 10uH	
L963	1-412-028-11	INDUCTOR CHIP 4.7uH	
L964	1-424-524-21	COIL, CHOKE 47uH	
L965	1-424-524-21	COIL, CHOKE 47uH	
L966	1-410-369-11	INDUCTOR CHIP 1uH	
L967	1-410-369-11	INDUCTOR CHIP 1uH	
L968	1-412-979-21	INDUCTOR 1uH	
L972	1-412-979-21	INDUCTOR 1uH	
L974	1-412-979-21	INDUCTOR 1uH	

Ref. No.	Part No.	Description	Remark
		(TRANSISTOR)	
Q950	8-729-823-95	TRANSISTOR FC149	
Q951	8-729-804-41	TRANSISTOR 2SB1122-S	
Q952	8-729-823-84	TRANSISTOR FP102	
Q953	8-729-823-82	TRANSISTOR FP101	
Q954	8-729-823-82	TRANSISTOR FP101	
Q955	8-729-905-12	TRANSISTOR DTA144EU	
Q957	8-729-011-26	TRANSISTOR 2SJ179	
Q958	8-729-920-48	TRANSISTOR IMH2	
Q959	8-729-011-26	TRANSISTOR 2SJ179	
Q960	8-729-402-81	TRANSISTOR XN4501	
		(RESISTOR)	
R950	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R951	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R952	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R953	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R954	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R955	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R956	1-218-347-11	METAL GLAZE 91K 5% 1/16W	
R957	1-218-332-11	METAL GLAZE 130K 5% 1/16W	
R958	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R959	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R960	1-218-296-11	METAL CHIP 75K 0.50% 1/16W	
R961	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R962	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R964	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R965	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R966	1-218-706-11	METAL CHIP 3.9K 0.50% 1/16W	
R967	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R968	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R969	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R970	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R971	1-218-330-11	METAL CHIP 11K 0.50% 1/16W	
R972	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R973	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R974	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R975	1-216-176-00	METAL GLAZE 120 5% 1/8W	
R976	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R977	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R978	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R980	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R981	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R982	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R983	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R984	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R985	1-218-728-11	METAL CHIP 33K 0.50% 1/16W	
R986	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R987	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R988	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
R989	1-216-821-11	METAL CHIP 1K 5% 1/16W	
		(TRANSFORMER)	
T950	1-450-874-21	TRANSFORMER, DC-DC CONVERTER	
		(VIBRATOR)	
X950	1-579-467-11	VIBRATOR, CERAMIC 475KHZ	

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Ref. No.	Part No.	Description	Remark
	A-7063-198-A	SL-28 BOARD, COMPLETE ********************** (Ref, No 3,000 Series)	
		(CAPACITOR)	
C500	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C503	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C504	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C505	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C506	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C507	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
		(CONNECTOR)	
CN501	1-691-473-21	CONNECTOR, FFC/FPC 7P	
CN502	1-691-472-21	CONNECTOR, FFC/FPC 6P	
CN503	1-691-482-21	CONNECTOR, FFC/FPC 15P	
		(IC)	
IC501	8-759-059-09	LB8111V	
		(COIL)	
L501	1-412-026-11	INDUCTOR CHIP 1uH	
		(TRANSISTOR)	
Q501	8-729-402-81	TRANSISTOR XN4501	
		(RESISTOR)	
R501	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R504	1-216-864-11	METAL CHIP 0 5% 1/16W	
R506	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R512	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R514	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R517	1-216-174-00	METAL GLAZE 100 5% 1/8W	
R519	1-216-864-11	METAL CHIP 0 5% 1/16W	
R520	1-216-864-11	METAL CHIP 0 5% 1/16W	
		(CONPOSITION CIRCUIT BLOCK)	
RB500	1-236-424-11	NETWORK, RES 10K	
RB502	1-236-424-11	NETWORK, RES 10K	
		(FLAT CABLE)	
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

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Ref. No.	Part No.	Description	Remark
	A-7071-616-A	SW-206 BOARD, COMPLETE ********************** (Ref, No 5,000 Series)	
		(CONNECTOR)	
CN580	1-691-483-21	CONNECTOR, FFC/FPC 4P	
		(RESISTOR)	
R580	1-216-857-11	METAL CHIP 1M 5% 1/16W	
		(SWITCH)	
S580	1-692-111-11	SWITCH, KEY BOARD (START/STOP)	
S581	1-571-275-31	SWITCH, SLIDE (STANDBY)	

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Ref. No.	Part No.	Description	Remark
	A-7063-195-A	VA-77 BOARD, COMPLETE ********************** (Ref, No 1,000 Series)	
*	3-946-181-01	CASE (MAIN), SHIELD, VA	
*	3-946-182-01	CASE (LID), SHIELD, VA	
		(CAPACITOR)	
C052	1-162-638-11	CERAMIC CHIP 1uF 16V	
C053	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C054	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C055	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C056	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C057	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C058	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C059	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C060	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C061	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C062	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C064	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C066	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C070	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C071	1-128-003-11	ELECT CHIP 22uF 20% 4V	
C072	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C073	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C074	1-128-004-11	ELECT CHIP 10uF 20% 16V	

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Ref. No.	Part No.	Description				Remark
C075	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C077	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C078	1-162-943-11	CERAMIC CHIP	15PF	5%	50V	
C091	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C092	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C093	1-164-337-11	CERAMIC CHIP	2.2uF		16V	
C095	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C096	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C101	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C102	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C103	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C104	1-164-145-11	CERAMIC CHIP	390PF	5%	50V	
C105	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C106	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C107	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C108	1-162-958-11	CERAMIC CHIP	270PF	5%	50V	
C109	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C112	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C113	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C114	1-162-942-11	CERAMIC CHIP	12PF	5%	50V	
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C117	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C118	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C119	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C120	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C121	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C122	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C123	1-162-922-11	CERAMIC CHIP	39PF	5%	50V	
C124	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V	
C125	1-164-382-11	CERAMIC CHIP	91PF	5%	50V	
C126	1-162-923-11	CERAMIC CHIP	47PF	5%	50V	
C128	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C201	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C202	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C203	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C204	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C205	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C206	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C207	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C208	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C209	1-128-008-11	ELECT CHIP	3.3uF	20%	35V	
C210	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C211	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C212	1-128-008-11	ELECT CHIP	3.3uF	20%	35V	
C213	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C214	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C215	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C217	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C218	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C219	1-164-005-11	CERAMIC CHIP	0.47uF		25V	

Ref. No.	Part No.	Description				Remark
C221	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C224	1-164-222-11	CERAMIC CHIP	0.22uF		25V	
C225	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C226	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C227	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C228	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C229	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C230	1-126-246-11	ELECT CHIP	220uF	20%	4V	
C231	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C232	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V	
C234	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C235	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C237	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C238	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C239	1-162-960-11	CERAMIC CHIP	220PF	10%	50V	
C240	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C241	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C242	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C243	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C244	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C245	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C246	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C247	1-164-392-11	CERAMIC CHIP	390PF	5%	50V	
C250	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C251	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C252	1-162-944-11	CERAMIC CHIP	18PF	5%	50V	
C254	1-164-363-11	CERAMIC CHIP	560PF	5%	50V	
C256	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C257	1-126-207-11	ELECT CHIP	33uF	20%	4V	
C258	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C259	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C260	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C261	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C271	1-164-458-11	CERAMIC CHIP	43PF	5%	50V	
C273	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C274	1-162-948-11	CERAMIC CHIP	39PF	5%	50V	
C275	1-162-955-11	CERAMIC CHIP	150PF	5%	50V	
C276	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C277	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C280	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C282	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C291	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C295	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C296	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C303	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C304	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C305	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C306	1-162-926-11	CERAMIC CHIP	82PF	5%	50V	
C307	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C308	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	

Ref. No.	Part No.	Description				Remark
C309	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C311	1-126-192-11	ELECT CHIP	0.68uF	20%	50V	
C312	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C313	1-163-035-00	CERAMIC CHIP	0.047uF		50V	
C314	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C315	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C316	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C319	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V	
C320	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C321	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C322	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C323	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C324	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C325	1-162-954-11	CERAMIC CHIP	120PF	5%	50V	
C326	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	
C327	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C328	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C329	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C330	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C331	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C332	1-162-952-11	CERAMIC CHIP	82PF	5%	50V	
C333	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C334	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C335	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C336	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	
C337	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C338	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C339	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C400	1-124-778-00	ELECT CHIP	22uF	20%	6.3V	
C403	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C404	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C406	1-164-346-11	CERAMIC CHIP	1uF		16V	
C413	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C414	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	
C416	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C417	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C426	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C427	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C428	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C429	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C430	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V	
C431	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	
C432	1-164-346-11	CERAMIC CHIP	1uF		16V	
C434	1-164-346-11	CERAMIC CHIP	1uF		16V	
C435	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C436	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C438	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C439	1-164-346-11	CERAMIC CHIP	1uF		16V	

Ref. No.	Part No.	Description				Remark
C440	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C442	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C444	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C446	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C448	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C450	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C453	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V	
C454	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C456	1-164-346-11	CERAMIC CHIP	1uF		16V	
C459	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C461	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C490	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C494	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C498	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C990	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C991	1-162-974-11	CERAMIC CHIP	0.01uF		50V	

〈 FILTER 〉

CF301	1-579-370-11	FILTER, CERAMIC

〈 CONNECTOR 〉

CN201	1-691-479-21	CONNECTOR, BOARD TO BOARD 40P
CN202	1-691-476-21	CONNECTOR, BOARD TO BOARD 20P
CN400	1-691-487-21	CONNECTOR, FFC/FPC 8P

〈 DIODE 〉

D102	8-719-800-76	DIODE	1SS226
D201	8-719-941-86	DIODE	DAN202U
D202	8-719-941-86	DIODE	DAN202U
D203	8-719-941-09	DIODE	DAP202U
D205	8-719-941-86	DIODE	DAN202U
D206	8-719-941-86	DIODE	DAN202U
D401	8-719-105-32	DIODE	RD2.7M-B2

〈 FILTER 〉

FL051	1-236-757-21	FILTER, LOW PASS (C)
FL053	1-236-834-21	FILTER, LOW PASS
FL054	1-415-751-21	DELAY LINE, LC (YH)
FL201	1-239-113-21	FILTER, LOW PASS (REC.Y)
FL301	1-236-575-11	B.P.F (PAL-M)
FL302	1-236-146-11	FILTER, BAND PASS

〈 IC 〉

IC051	8-752-332-68	IC	CXL5502M
IC052	8-759-710-29	IC	NJM2235M
IC053	8-759-031-84	IC	SC7S04F
IC054	8-752-053-21	IC	CXA1211M
IC201	8-752-036-19	IC	CXA1207AR
IC202	8-759-710-29	IC	NJM2235M

Ref. No.	Part No.	Description		Remark
IC203	8-759-055-82	IC	M62353GP	
IC204	8-759-055-82	IC	M62353GP	
IC205	8-759-636-33	IC	CXA1452N	
IC206	8-752-053-21	IC	CXA1211M	
IC301	8-752-036-20	IC	CXA1208R	
IC400	8-759-234-77	IC	TC4S66F	
IC401	8-759-823-19	IC	CXA1488R	
		(COIL)		
L051	1-412-026-11	INDUCTOR CHIP	1uH	
L052	1-412-031-11	INDUCTOR CHIP	47uH	
L053	1-412-029-11	INDUCTOR CHIP	10uH	
L054	1-410-656-11	INDUCTOR CHIP	150uH	
L090	1-412-029-11	INDUCTOR CHIP	10uH	
L101	1-412-029-11	INDUCTOR CHIP	10uH	
L102	1-410-385-11	INDUCTOR CHIP	22uH	
L103	1-412-280-31	INDUCTOR	330uH	
L104	1-410-167-41	INDUCTOR CHIP	820uH	
L105	1-410-657-21	INDUCTOR CHIP	180uH	
L109	1-410-657-21	INDUCTOR CHIP	180uH	
L110	1-410-387-11	INDUCTOR CHIP	33uH	
L113	1-410-381-11	INDUCTOR CHIP	10uH	
L114	1-410-380-31	INDUCTOR CHIP	8.2uH	
L115	1-412-280-31	INDUCTOR	330uH	
L116	1-410-655-31	INDUCTOR CHIP	120uH	
L202	1-412-031-11	INDUCTOR CHIP	47uH	
L203	1-412-029-11	INDUCTOR CHIP	10uH	
L204	1-410-393-11	INDUCTOR CHIP	100uH	
L205	1-410-375-11	INDUCTOR CHIP	3.3uH	
L207	1-410-390-11	INDUCTOR CHIP	56uH	
L208	1-410-389-31	INDUCTOR CHIP	47uH	
L210	1-410-370-31	INDUCTOR CHIP	1.2uH	
L211	1-410-390-11	INDUCTOR CHIP	56uH	
L213	1-410-383-31	INDUCTOR CHIP	15uH	
L301	1-410-385-11	INDUCTOR CHIP	22uH	
L302	1-410-385-11	INDUCTOR CHIP	22uH	
L303	1-410-393-11	INDUCTOR CHIP	100uH	
L304	1-410-379-21	INDUCTOR CHIP	6.8uH	
L305	1-410-393-11	INDUCTOR CHIP	100uH	
L306	1-410-655-31	INDUCTOR CHIP	120uH	
L307	1-410-656-11	INDUCTOR CHIP	150uH	
L308	1-410-393-11	INDUCTOR CHIP	100uH	
L400	1-410-384-31	INDUCTOR CHIP	18uH	
L990	1-412-026-11	INDUCTOR CHIP	1uH	
		(TRANSISTOR)		
Q051	8-729-920-48	TRANSISTOR	IMH2	
Q052	8-729-141-48	TRANSISTOR	2SB624-BV345	
Q053	8-729-010-60	TRANSISTOR	MSA1586-BC	
Q055	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q057	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q060	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q061	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q063	8-729-422-54	TRANSISTOR	XN4215	
Q064	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q065	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q066	8-729-010-60	TRANSISTOR	MSA1586-BC	
Q067	8-729-905-96	TRANSISTOR	DTA114TU	
Q103	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q104	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q110	8-729-920-99	TRANSISTOR	DTA114EU	
Q111	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q114	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q115	8-729-905-12	TRANSISTOR	DTA144EU	
Q118	8-729-920-48	TRANSISTOR	IMH2	
Q119	8-729-905-23	TRANSISTOR	2SA1576-R	
Q120	8-729-102-07	TRANSISTOR	2SC2223-F13	
Q122	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q202	8-729-010-60	TRANSISTOR	MSA1586-BC	
Q204	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q213	8-729-905-18	TRANSISTOR	DTC144EU	
Q214	8-729-106-60	TRANSISTOR	2SB1115A-YG	
Q215	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q216	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q217	8-729-905-12	TRANSISTOR	DTA144EU	
Q218	8-729-402-81	TRANSISTOR	XN4501	
Q220	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q222	8-729-402-81	TRANSISTOR	XN4501	
Q223	8-729-905-12	TRANSISTOR	DTA144EU	
Q224	8-729-905-18	TRANSISTOR	DTC144EU	
Q225	8-729-905-18	TRANSISTOR	DTC144EU	
Q226	8-729-823-16	TRANSISTOR	2SC4555-5.6.7	
Q227	8-729-905-18	TRANSISTOR	DTC144EU	
Q228	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q229	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q230	8-729-010-60	TRANSISTOR	MSA1586-BC	
Q232	8-729-010-60	TRANSISTOR	MSA1586-BC	
Q233	8-729-925-42	TRANSISTOR	IMT2	
Q235	8-729-010-60	TRANSISTOR	MSA1586-BC	
Q302	8-729-402-81	TRANSISTOR	XN4501	
Q304	8-729-905-12	TRANSISTOR	DTA144EU	
Q306	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q307	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q308	8-729-010-60	TRANSISTOR	MSA1586-BC	
Q309	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q312	8-729-420-20	TRANSISTOR	XN4312	
Q313	8-729-905-12	TRANSISTOR	DTA144EU	
Q314	8-729-010-75	TRANSISTOR	MSC4116-B/C	
Q318	8-729-905-18	TRANSISTOR	DTC144EU	
Q401	8-729-921-08	TRANSISTOR	DTC144TU	
Q402	8-729-905-18	TRANSISTOR	DTC144EU	

Ref. No.	Part No.	Description				Remark
Q990	8-729-106-60	TRANSISTOR	2SB1115A-YQ			
Q991	8-729-010-75	TRANSISTOR	MSC4116-B/C			
		〈 RESISTOR 〉				
R051	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R052	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R053	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R054	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R055	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R056	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R059	1-216-864-11	METAL CHIP	0	5%	1/16W	
R060	1-216-864-11	METAL CHIP	0	5%	1/16W	
R061	1-216-864-11	METAL CHIP	0	5%	1/16W	
R062	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R063	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R064	1-216-817-11	METAL CHIP	470	5%	1/16W	
R065	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R068	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R072	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R073	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R074	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R075	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R079	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R081	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R082	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R083	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R085	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R086	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R088	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R089	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R090	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R091	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R092	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R093	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R106	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R107	1-216-811-11	METAL CHIP	150	5%	1/16W	
R108	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R109	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R110	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R111	1-216-812-11	METAL CHIP	180	5%	1/16W	
R114	1-216-818-11	METAL CHIP	560	5%	1/16W	
R125	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R126	1-216-820-11	METAL CHIP	820	5%	1/16W	
R127	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R128	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R129	1-216-817-11	METAL CHIP	470	5%	1/16W	
R130	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R131	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R132	1-216-808-11	METAL CHIP	82	5%	1/16W	
R133	1-216-864-11	METAL CHIP	0	5%	1/16W	
R137	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R140	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R141	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R142	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R143	1-216-864-11	METAL CHIP	0	5%	1/16W	
R144	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R147	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R148	1-216-818-11	METAL CHIP	560	5%	1/16W	
R149	1-216-809-11	METAL CHIP	100	5%	1/16W	
R150	1-216-817-11	METAL CHIP	470	5%	1/16W	
R151	1-216-817-11	METAL CHIP	470	5%	1/16W	
R152	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R153	1-216-818-11	METAL CHIP	560	5%	1/16W	
R154	1-216-818-11	METAL CHIP	560	5%	1/16W	
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R157	1-216-864-11	METAL CHIP	0	5%	1/16W	
R158	1-216-817-11	METAL CHIP	470	5%	1/16W	
R159	1-216-815-11	METAL CHIP	330	5%	1/16W	
R201	1-216-820-11	METAL CHIP	820	5%	1/16W	
R202	1-216-820-11	METAL CHIP	820	5%	1/16W	
R203	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R204	1-216-864-11	METAL CHIP	0	5%	1/16W	
R205	1-216-864-11	METAL CHIP	0	5%	1/16W	
R207	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R208	1-216-804-11	METAL CHIP	39	5%	1/16W	
R209	1-216-804-11	METAL CHIP	39	5%	1/16W	
R211	1-216-820-11	METAL CHIP	820	5%	1/16W	
R212	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R213	1-216-804-11	METAL CHIP	39	5%	1/16W	
R214	1-216-804-11	METAL CHIP	39	5%	1/16W	
R215	1-216-807-11	METAL CHIP	68	5%	1/16W	
R216	1-218-740-11	METAL CHIP	100K	0.50%	1/16W	
R217	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R220	1-216-818-11	METAL CHIP	560	5%	1/16W	
R221	1-216-818-11	METAL CHIP	560	5%	1/16W	
R222	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R223	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R224	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R225	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R230	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R231	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R232	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R236	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R239	1-216-817-11	METAL CHIP	470	5%	1/16W	
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R248	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R249	1-216-813-11	METAL CHIP	220	5%	1/16W	
R250	1-216-841-11	METAL CHIP	47K	5%	1/16W	

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Ref. No.	Part No.	Description				Remark
R251	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R252	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R253	1-216-818-11	METAL CHIP	560	5%	1/16W	
R254	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R256	1-216-810-11	METAL CHIP	120	5%	1/16W	
R257	1-216-813-11	METAL CHIP	220	5%	1/16W	
R259	1-216-864-11	METAL CHIP	0	5%	1/16W	
R260	1-216-815-11	METAL CHIP	330	5%	1/16W	
R261	1-216-813-11	METAL CHIP	220	5%	1/16W	
R262	1-216-815-11	METAL CHIP	330	5%	1/16W	
R263	1-216-820-11	METAL CHIP	820	5%	1/16W	
R264	1-216-807-11	METAL CHIP	68	5%	1/16W	
R265	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R266	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R267	1-216-817-11	METAL CHIP	470	5%	1/16W	
R268	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R269	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R270	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R271	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R272	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R275	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R276	1-216-817-11	METAL CHIP	470	5%	1/16W	
R277	1-216-817-11	METAL CHIP	470	5%	1/16W	
R279	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R280	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R281	1-216-817-11	METAL CHIP	470	5%	1/16W	
R282	1-216-817-11	METAL CHIP	470	5%	1/16W	
R283	1-216-817-11	METAL CHIP	470	5%	1/16W	
R284	1-216-817-11	METAL CHIP	470	5%	1/16W	
R285	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R286	1-216-811-11	METAL CHIP	150	5%	1/16W	
R287	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R293	1-216-864-11	METAL CHIP	0	5%	1/16W	
R295	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R296	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R298	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R299	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R301	1-218-740-11	METAL CHIP	100K	0.50%	1/16W	
R305	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R306	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R307	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R308	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R309	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R310	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R311	1-216-817-11	METAL CHIP	470	5%	1/16W	
R312	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R318	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R319	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R320	1-216-817-11	METAL CHIP	470	5%	1/16W	
R321	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R323	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R324	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R326	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R327	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R328	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R329	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R330	1-216-818-11	METAL CHIP	560	5%	1/16W	
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R332	1-216-818-11	METAL CHIP	560	5%	1/16W	
R333	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R335	1-216-864-11	METAL CHIP	0	5%	1/16W	
R336	1-216-864-11	METAL CHIP	0	5%	1/16W	
R339	1-216-864-11	METAL CHIP	0	5%	1/16W	
R340	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R344	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R345	1-216-819-11	METAL CHIP	680	5%	1/16W	
R347	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R348	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R402	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R403	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R404	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R406	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W	
R408	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R410	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R412	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R413	1-216-817-11	METAL CHIP	470	5%	1/16W	
R414	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R415	1-216-864-11	METAL CHIP	0	5%	1/16W	
R416	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R417	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R419	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R421	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R424	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R429	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R470	1-216-808-11	METAL CHIP	82	5%	1/16W	
R471	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R472	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R473	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R476	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R478	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R480	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R481	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R950	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R953	1-216-813-11	METAL CHIP	220	5%	1/16W	
R954	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R955	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R957	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R958	1-216-815-11	METAL CHIP	330	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R960	1-216-817-11	METAL CHIP 470 5% 1/16W	
R961	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R962	1-216-815-11	METAL CHIP 330 5% 1/16W	
R963	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R964	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R965	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R990	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R991	1-216-138-00	METAL CHIP 3.3 5% 1/8W	
R995	1-216-820-11	METAL CHIP 820 5% 1/16W	
R996	1-216-836-11	METAL CHIP 18K 5% 1/16W	

(CONPOSITION CIRCUIT BLOCK)

Ref. No.	Part No.	Description	Remark
RB101	1-236-428-11	NETWORK, RES 22K	
RB201	1-236-424-11	NETWORK, RES 10K	
RB301	1-236-414-11	NETWORK, RES 1.5K	

(VARIABLE RESISTOR)

Ref. No.	Part No.	Description	Remark
RV051	1-238-087-11	RES, ADJ, CERMET 1K	

(VIBRATOR)

Ref. No.	Part No.	Description	Remark
X301	1-579-240-11	VIBRATOR, CRYSTAL (3.58MHZ)	

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A-7063-019-A VF-44 BOARD, COMPLETE
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(Ref.No 2,000 Series)

(CAPACITOR)

Ref. No.	Part No.	Description	Remark
C501	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C502	1-126-176-11	ELECT 220uF 20% 10V	
C503	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
C504	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
⚠C505	1-163-053-00	CERAMIC CHIP 0.0033uF 10% 50V	
⚠C506	1-163-058-00	CERAMIC CHIP 0.0082uF 10% 50V	
C508	1-127-515-11	ELECT(SOLID) 47uF 20% 6.3V	
C509	1-126-090-11	ELECT 82uF 20% 10V	
C510	1-164-611-11	CERAMIC CHIP 0.001uF 10% 500V	
C511	1-124-257-00	ELECT 2.2uF 20% 50V	
C512	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C513	1-137-306-11	FILM CHIP 0.1uF 5% 16V	
C514	1-162-638-11	CERAMIC CHIP 1uF 16V	
C515	1-131-381-00	TANTALUM 47uF 10% 10V	
C516	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C517	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
* CN501	1-566-762-11	PIN, CONNECTOR (PC BOARD) 7P	
* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	

(DIODE)

Ref. No.	Part No.	Description	Remark
⚠D501	8-719-024-87	DIODE LN1261CAL	
D502	8-719-024-87	DIODE LN1261CAL	
D503	8-719-400-20	DIODE MA152WA	

(IC)

Ref. No.	Part No.	Description	Remark
IC501	8-759-420-01	IC AN2512S	

(COIL)

Ref. No.	Part No.	Description	Remark
L501	1-412-031-11	INDUCTOR CHIP 47uH	
L502	1-410-385-11	INDUCTOR CHIP 22uH	
⚠L503	1-460-220-11	COIL, FERRITE (HLC)	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q501	8-729-216-31	TRANSISTOR 2SA1163-G	
Q502	8-729-100-66	TRANSISTOR 2SC1623-L5L6	
Q503	8-729-106-68	TRANSISTOR 2SD1615A-GP	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R501	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R502	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R503	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R504	1-216-041-00	METAL CHIP 470 5% 1/10W	
R505	1-216-041-00	METAL CHIP 470 5% 1/10W	
R506	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R507	1-216-051-00	METAL CHIP 1.2K 5% 1/10W	
R508	1-216-005-00	METAL CHIP 15 5% 1/10W	
R509	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R510	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R511	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R512	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R513	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R514	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R515	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R516	1-216-025-00	METAL CHIP 100 5% 1/10W	
R517	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R518	1-216-336-11	METAL CHIP 47K 1% 1/10W	
R519	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R520	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R521	1-216-160-00	METAL GLAZE 27 5% 1/8W	
R522	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R523	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R524	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R525	1-216-031-00	METAL CHIP 180 5% 1/10W	
R526	1-216-748-11	METAL CHIP 39K 1% 1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
		(VARIABLE RESISTOR)	
RV501	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV501	1-238-854-11	RES, ADJ, CERMET 2.2K	
RV502	1-241-497-11	RES, ADJ, METAL GLAZE	
RV503	1-238-096-11	RES, ADJ, CERMET 1M	
RV503	1-238-862-11	RES, ADJ, CERMET 1M	
RV504	1-238-092-11	RES, ADJ, CERMET 47K	
RV504	1-238-858-11	RES, ADJ, CERMET 47K	
RV505	1-238-086-11	RES, ADJ, CERMET 470	
RV505	1-238-852-11	RES, ADJ, CERMET 470	
		(SWITCH)	
S501	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT SEARCH +)	
S502	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT SEARCH -)	
		(TRANSFORMER)	
⚠T501	1-439-525-11	TRANSFORMER ASSY, FLYBACK	
		(THERMISTOR)	
TH501	1-809-350-21	THERMISTOR, NTC (2125)	
		(FLAT CABLE)	
W502	1-526-978-51	SOCKET ASSY, CRT	

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A-7071-613-A VK-28 BOARD, COMPLETE

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(Ref, No 5,000 Series)

Ref. No.	Part No.	Description	Remark
		(CONNECTOR)	
CN571	1-691-487-21	CONNECTOR, FFC/FPC 8P	
CN574	1-691-483-21	CONNECTOR, FFC/FPC 4P	
* CN575	1-580-055-21	PIN, CONNECTOR 2P	
		(DIODE)	
D570	8-719-820-05	DIODE 1SS181	
		(SWITCH)	
S570	1-572-498-11	SWITCH, SLIDE (EJECT)	
S571	1-572-921-31	SWITCH, KEY BOARD (REW)	
S572	1-572-921-31	SWITCH, KEY BOARD (FF)	
S573	1-572-921-31	SWITCH, KEY BOARD (PLAY)	
S574	1-572-921-31	SWITCH, KEY BOARD (STOP)	
S576	1-572-921-31	SWITCH, KEY BOARD (PAUSE)	
		(FLAT CABLE)	
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	
W573	1-690-606-11	CABLE, FLAT (FFC-32) 8P	

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MISCELLANEOUS

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Ref. No.	Part No.	Description	Remark
11	1-550-743-11	HOLDER, BATTERY	
23	1-542-126-41	MICROPHONE UNIT	
31	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
105	1-692-025-11	SWITCH, PUSH	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
132	1-547-558-21	FILTER BLOCK, OPTICAL	
133	1-547-541-11	LENS, ZOOM (VCL-6110WB)	
322	1-691-254-12	CONNECTOR, TRANSLATION 10P	
IC901	8-752-607-32	IC ICX054AK-2 (CCD IMAGER)	
M901	A-7048-625-A	DRUM ASSY (DGH-0A2A-R)	
M902	8-835-477-01	MOTOR, DC SCE-010A (CAPSTAN)	
M903	A-7040-304-A	MOTOR, BLOCK ASSY, LM (LOADING)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S002	1-572-987-11	SWITCH, PUSH (3 KEY)	
S005	1-570-771-21	SWITCH (C DOWN)	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	

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ACCESSORIES & PACKING MATERIALS

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Ref. No.	Part No.	Description	Remark
	3-738-517-01	BELT, SHOULDER	
*	3-948-354-01	CUSHION, ACC	
	A-6768-253-A	RF ADAPTOR (RFU-90UC)	
	3-755-242-21	MANUAL, INSTRUCTION (ENGLISH)(FX310)	
	3-755-242-31	MANUAL, INSTRUCTION (FRENCH)	(FX310:Canadian)
	3-755-296-21	MANUAL, INSTRUCTION (ENGLISH)(FX311)	
*	3-795-581-21	SAFEGUARD (SONY), IMPORTANT	(FX310:US/FX311)
*	3-947-112-01	CUSHION (LOWER)	
*	3-948-353-01	INDIVIDUAL CARTON (FX310)	
*	3-948-355-01	CUSHION (LOWER) (FX310:US)	
*	3-948-478-01	INDIVIDUAL CARTON (FX311)	
	9-910-999-32	BAG, PROTECTION	
*	1-693-017-11	REMOTE COMMANDER (CAM CODER)(RMT-509)	
	3-947-500-01	LID, BATTERY CASE	
**	AC-V35/V35A	AC POWER ADAPTOR	
***	NP-55	BATTERY PACK	

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

SECTION 7
CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 204.

7-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

7-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Stabilized power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Part Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 used) White balance check
	ND filter 0.4	J-6080-806-A	Max gain adjustment
	ND filter 0.3	J-6080-818-A	White balance adjustment
	ND filter 0.1	J-6080-807-A	Max gain adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote control unit (RM-95-remodeled in part)[Note 1]	J-6082-053-A	
J-6	Siemens star	J-6080-875-A	Flange back check
J-7	Measuring pin for camera section	J-6082-139-A	For the camera section adjustment
J-8	Extension cord (30P, 0.8 mm)	J-6082-167-A	For extension of CS-37 board (For the mecha deck check)
J-9	Extension cord (40P, 0.8 mm)	J-6082-168-A	For extension of VA-77 board (For the video section adjustment)
	Extension cord (20P, 0.8 mm)	J-6082-169-A	For extension of VA-77 board (For the video section adjustment)
	Extension cord (18P, 0.8 mm)	J-6082-170-A	For extension of CD-96 board (For the repair of the camera section)
J-10	Extension cord (21P, 0.5 mm)	J-6082-171-A	For extension of lens block (For the repair of the camera section)
J-11	Extension cord (15P, 0.8 mm)	J-6082-172-A	For extension of cabinet L (PJ-50, VK-28 boards) (For the video section adjustment)
	Extension cord (8P, 0.8 mm)	J-6082-173-A	For extension of cabinet L (PJ-50, VK-28 boards) (For the video section adjustment)

Note: If the micro processor IC in the adjusting remote control unit is not the new micro processor (UPD7503G-C56-12), the switchover of the page cannot be carried out. In this case, replace with the new micro processor (8-759-148-35).

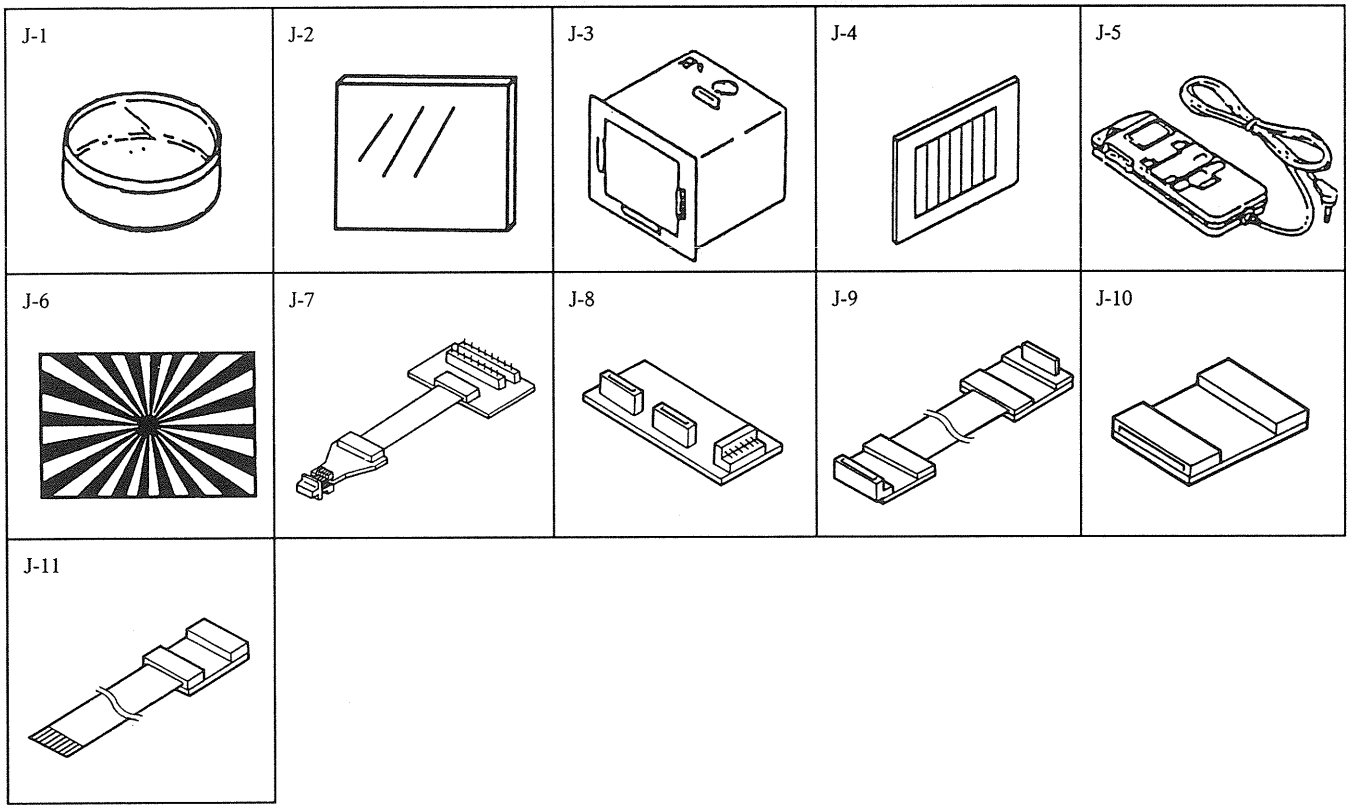

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11

Fig. 7-1.

7-1-2. Preparations

Note: For further details on how to remove the cabinet and each board, refer to "1. Disassembly".

1) Connect the equipments for adjustment as shown in Fig. 7-3.

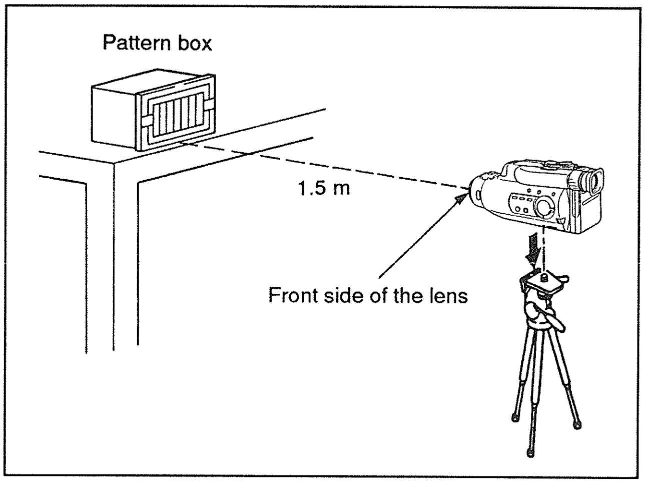

Pattern box
1.5 m
Front side of the lens

Fig. 7-2.

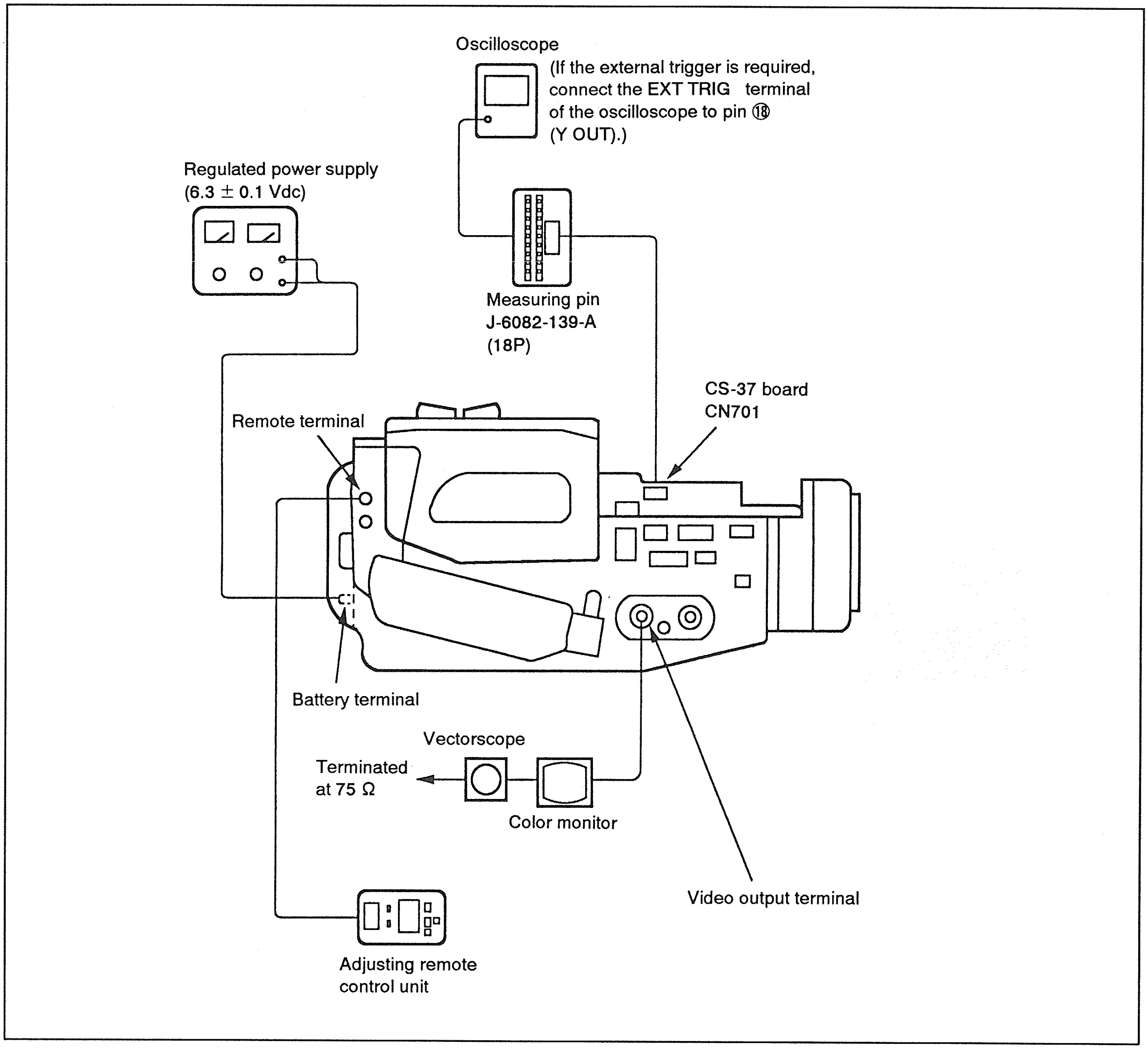

Oscilloscope
(If the external trigger is required, connect the EXT TRIG terminal of the oscilloscope to pin ⑱ (Y OUT).)
Regulated power supply (6.3 ± 0.1 Vdc)
Measuring pin J-6082-139-A (18P)
CS-37 board CN701
Remote terminal
Battery terminal
Vectorscope
Terminated at 75 Ω
Color monitor
Video output terminal
Adjusting remote control unit

Fig. 7-3.

7-1-3. Precautions

1. Switch settings

Set the switches to the following positions, and perform the adjustments without inserting the tape, unless specified otherwise.

1. Camera/player power switch (PK-35 board S540) ····Camera
2. Standby switch (SW-206 board S581)················· Standby
3. AE dial (CK-61 board S560) ································ OFF
4. Back light button (CK-61 board S567)······················Off

2. Adjustment Procedure

Perform in the given order as a rule.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the display frame as shown in Fig. 7-4. if adjustments are performed using the color bar chart.
   (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and adjust the zoom lever so that the white pattern becomes the same size and is in the same position as the color bar chart (Standard picture frame).

Color bar chart standard picture frame

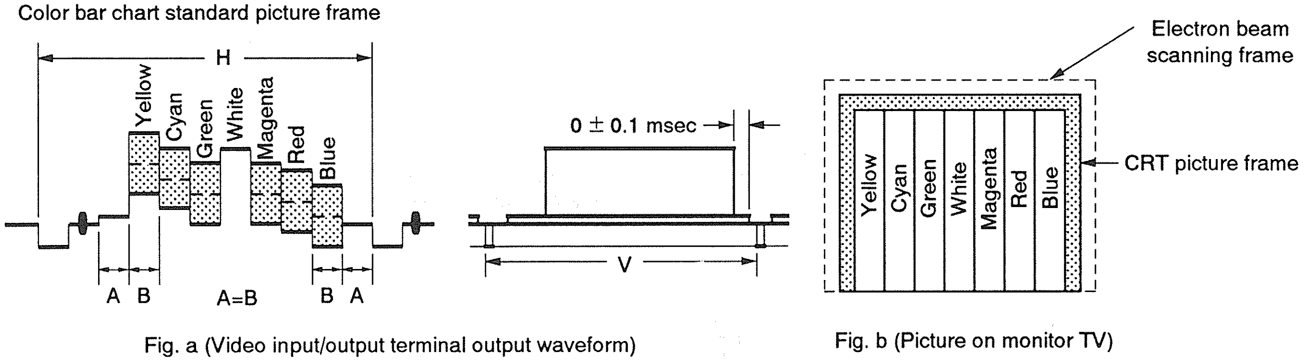

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A
0 ± 0.1 msec
V
Electron beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. a (Video input/output terminal output waveform)

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 7-5.

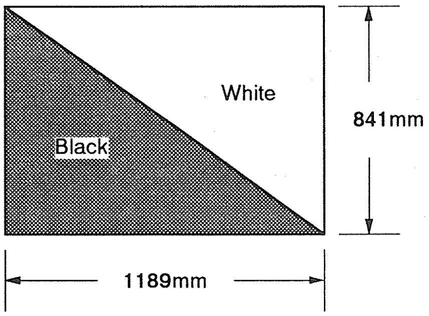

White
Black
841mm
1189mm

Fig. 7-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-4. Adjusting Remote Control Unit

The camera section is adjusted by changing the constant using the coefficient of the digital signal processing calculation, or modifying the output voltage of EVR IC (CS-37 board IC702). These processes are carried out by the camera micro processor (CS-37 board IC709). This micro processor reads the data written in the non-volatile memory (CS-37 board IC712), and transmits it to the digital signal processing circuit and EVR.

The adjusting remote control unit is used for rewriting the adjustment data written in the non-volatile memory necessary for performing the adjustments.

The adjusting remote control unit uses the remote control signal line (LANC) to correspond mutually with the camera micro processor. The page, address and the up/down command of the data can be transmitted from the remote control unit to the camera micro processor. On the other hand, the page, address, and data can also be transmitted the other way round.

1. Using the adjusting remote control unit

1) Connect the adjusting remote control unit to the remote terminal (PS-308 board J951).
2) Adjust the HOLD switch of the adjusting remote control unit to HOLD (SERVICE position).
   If it has been properly connected, the LCD on the adjusting remote control unit will show the display in Fig. 7-6.

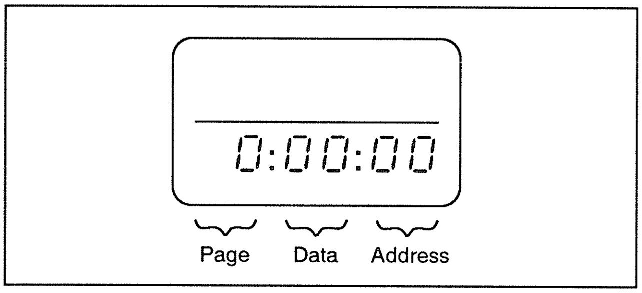


Fig. 7-6.

3) Operate the adjusting remote control unit as follows.
   - Changing the page
     The page will increase when the EDIT SEARCH+ button is pressed. It will decrease when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   - Changing the address
     The address will increase when the FF (▶▶) button is pressed, and decrease when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF. However, the addresses which are not used for the adjustments will not be displayed.
   - Changing the data (Data setting)
     The data will increase when the PLAY (▶) button is pressed, and decrease when the STOP (■) button is pressed.
     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     It is necessary to press the PAUSE button to write the adjustment data (F page, D page) in the non-volatile memory.
     (The new adjustment data will not be recorded in the non-volatile memory if this operation is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. This releases the write protect of page F, and the camera section (F page) can be adjusted.
5) After completing all adjustments, turn off the main power (6.3V) once. This can release the adjustment mode (other than page F).

2. Precautions upon using the adjusting remote control unit

The correct adjustment data may be erased at times, due to operation errors of the adjusting remote control unit. To prevent this from occurring, it is recommended that all adjustment data be recorded in the memory before beginning adjustments, and the new adjustment data be recorded in the memory after each adjustment.

7-1-5. Page F Address List

Note 1: The data listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are the values after performing "Page F Data Initialization" and "Page F Data Modification". They are different from the value after performing all the adjustments.

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2" colspan="2">Function
[ ] indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>00</td><td>ID</td><td colspan="2">Set ID</td><td>00</td><td>3A</td></tr>
<tr><td>01</td><td>FADER LEVEL</td><td colspan="2">AE REF level modification during fader</td><td>E0</td><td>E0</td></tr>
<tr><td>02</td><td>FADER ENDTIM</td><td colspan="2">The setting of the AE REF modulation time during fader</td><td>10</td><td>10</td></tr>
<tr><td>03</td><td>CS SL</td><td colspan="2">Carrier balance adjustment</td><td>35</td><td></td></tr>
<tr><td>04</td><td>VSUB</td><td colspan="2">CCD imager V SUB adjustment [IC702 ③]</td><td>80</td><td></td></tr>
<tr><td>05</td><td>VPGH</td><td colspan="2">CCD imager VRG adjustment [IC702 ④]</td><td>80</td><td></td></tr>
<tr><td>06</td><td>VREF Y</td><td colspan="2">Camera core Y D/A standard voltage, SYNC level adjustment [IC702 ⑤]</td><td>7B</td><td></td></tr>
<tr><td>07</td><td>VREF C</td><td colspan="2">Camera core CHROMA D/A standard voltage, BURST level adjustment [IC702 ⑥]</td><td>99</td><td></td></tr>
<tr><td>08</td><td>HALL GAIN</td><td>Hole amplifier gain adjustment [IC702 ⑦]</td><td rowspan="2">HALL adjustment</td><td>47</td><td></td></tr>
<tr><td>09</td><td>HALL OFFSET</td><td>Hole amplifier offset adjustment [IC702 ⑧]</td><td>71</td><td></td></tr>
<tr><td>0A</td><td>E LOWLIGHT START</td><td colspan="2">Low luminance intensity REF level modulation start setting</td><td>30</td><td>30</td></tr>
<tr><td>0B</td><td>REF 2V</td><td colspan="2">2V standard voltage for hole element [IC702 ⑫]</td><td>68</td><td>68</td></tr>
<tr><td>0C</td><td>AD REF</td><td colspan="2">Black level setting during A/D conversion, A/D off set adjustment [IC702 ⑬]</td><td>72</td><td></td></tr>
<tr><td>0D</td><td>CORE DETH</td><td colspan="2">CCD correction control</td><td>04</td><td>04</td></tr>
<tr><td>0E</td><td>CORE VTR DELAY</td><td colspan="2">1HDL longitudinal setting during VTR playback</td><td>16</td><td>16</td></tr>
<tr><td>0F</td><td>CORE APCN4</td><td colspan="2">Horizontal aperture setting</td><td>A5</td><td>A5</td></tr>
<tr><td>10</td><td>CORE APCN5</td><td colspan="2">Vertical aperture setting</td><td>3D</td><td>3D</td></tr>
<tr><td>11</td><td>CORE EFECT</td><td colspan="2">Special effect control</td><td>A8</td><td>A8</td></tr>
<tr><td>12</td><td>CORE MATR</td><td colspan="2">BLUE matrix constant</td><td>27</td><td>27</td></tr>
<tr><td>13</td><td>CORE MATB</td><td colspan="2">RED matrix constant</td><td>6C</td><td>6C</td></tr>
<tr><td>14</td><td>CORE BURST LEVEL</td><td colspan="2">Burst flag level setting, color modulation ON/OFF<table><tr><th>Data</th><th>Adjustment modeAdjustment</th></tr><tr><td>2C</td><td>Normal level</td></tr><tr><td>2E</td><td>Color modulation stopped</td></tr></table></td><td>2C</td><td>2C</td></tr>
<tr><td>15</td><td>CORE CHROMA DLY</td><td colspan="2">Y/C delay adjustment</td><td>08</td><td>08</td></tr>
<tr><td>16</td><td>CORE Y SETUP</td><td colspan="2">Set up level setting</td><td>08</td><td>08</td></tr>
<tr><td>17</td><td>CORE VHAPCN</td><td colspan="2">Slice and level setting of the aperture signal</td><td>17</td><td>17</td></tr>
<tr><td>18</td><td>CORE B-Y GAIN</td><td>B–Y GAIN</td><td rowspan="4">Color reproduction adjustments</td><td>13</td><td></td></tr>
<tr><td>19</td><td>CORE R-Y GAIN</td><td>R–Y GAIN</td><td>11</td><td></td></tr>
<tr><td>1A</td><td>CORE R-Y HUE</td><td>R–Y HUE</td><td>FF</td><td></td></tr>
<tr><td>1B</td><td>CORE B-Y HUE</td><td>B–Y HUE</td><td>FD</td><td></td></tr>
<tr><td>1C</td><td>CS/APCCUT</td><td colspan="2">Low luminance intensity aperture and chroma suppress level</td><td>22</td><td>22</td></tr>
</table>

Table 7-2 (1).

Address	Name	Function [ ] indicate the adjustment voltage output terminal		Adjustment data	
				Initial value	Memo column
1D	NEXT LINE DEFECT BIT	CCD correction pattern	CCD imager correction data write	00	
1E	CCD DEFECT0	CCD correction data		00	
1F	CCD DEFECT1	CCD correction data		00	
20	CCD DEFECT2	CCD correction data		00	
21	CCD DEFECT3	CCD correction data		00	
22	CCD DEFECT4	CCD correction data		00	
23	CCD DEFECT5	CCD correction data		00	
24	CCD DEFECT6	CCD correction data		00	
25	CCD DEFECT7	CCD correction data		00	
26	CCD DEFECT8	CCD correction data		00	
27	CCD DEFECT9	CCD correction data		00	
28	CCD DEFECT10	CCD correction data		00	
29	CCD DEFECT11	CCD correction data		00	
2A	CCD DEFECT12	CCD correction data		00	
2B	CCD DEFECT13	CCD correction data		00	
2C	CCD DEFECT14	CCD correction data		00	
2D	RREF L	3200k Red standard data LSB	Auto white balance preset adjustment	72	
2E	RREF H	3200k Red standard data MSB		5F	
2F	GREF L	3200k Green standard data LSB		D4	
30	GREF H	3200k Green standard data MSB		63	
31	BREF L	3200k Blue standard data LSB		3B	
32	BREF H	3200k Blue standard data MSB		2C	
33	RCONTREF	3200k RCONT adjustment value	Pre-white balance adjustment	42	
34	BCONTREF	3200k BCONT adjustment value		4A	
35	AWB NOWM R	Red regular correction coefficient	Auto white balance adjustment	7E	
36	AWB NORM B	Blue regular correction coefficient		96	
37	AWB SHUT IN	Indoor determination shutter data		A8	A8
38	ABW SHUT OUT	Outdoor determination shutter data		A0	A0
39	AWB IRIS IN	Indoor determination hole data	IRIS IN/OUT adjustment	79	
3A	AWB IRIS OUT	Outdoor determination hole data		7F	
3B	AWB G LEVEL	High luminance section green integral level		02	02
3C	AWB G WIDTH	High luminance section green integral level range		03	03
3D	DMAT HUE	Variable linear matrix HUE coefficient	Linear matrix adjustment	00	
3E	DMAT GAIN	Variable linear matrix GAIN coefficient		00	
3F	AWB SELECT	AWB mode selection		00	00
40	AWB DIFF	Standard difference from the outdoor fixed value		0A	0A
41	AWB BOTTOM SLP R	AWB incoming frame bottom R coefficient		48	48
42	AWB BOTTOM SLP B	AWB incoming frame bottom B coefficient		78	78
43	AWB MIDDLE SLP R	AWB incoming frame middle R coefficient		60	60
44	AWB MIDDLE SLP B	AWB incoming frame middle B coefficient		40	40
45	AWB TOP SLP R	AWB incoming frame top R coefficient		66	66
46	AWB TOP SLP B	AWB incoming frame top B coefficient		18	18
47	AWB KEIKO R	AWB incoming frame fluorescent light R coefficient		66	66
48	AWB KEIKO B	AWB incoming frame fluorescent light B coefficient		18	18
49	AWB BOTTOM UP	AWB incoming frame bottom upper value		C2	C2

Table 7-2 (2).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
4A	AWB BOTTOM DWN	AWB incoming frame bottom lower value	8C	8C
4B	AWB MIDDLE UP	AWB incoming frame middle upper value	AD	AD
4C	AWB MIDDLE DWN	AWB incoming frame middle lower value	96	96
4D	AWB TOP UP	AWB incoming frame top upper value	78	78
4E	AWB TOP DWN	AWB incoming frame top lower value	60	60
4F	AWB KEIKO	AWB incoming frame fluorescent light output lower value	66	66
50	AWB KEIKO DWN	AWB incoming frame fluorescent light lower value	59	59
51	AWB R TOP LMT	AWB incoming frame Rcont upper value	6E	6E
52	AWB R DWN LMT	AWB incoming frame Rcont lower value	20	20
53	AWB B TOP LMT	AWB incoming frame Bcont upper value	83	83
54	AWB B IN TOP	AWB incoming frame Bcont	67	67
55	AWB B IN MAX	AWB incoming frame Bcont	5C	5C
56	AWB B OUT MIN	AWB incoming frame Bcont	5C	5C
57	AWB B OUT DWN	AWB incoming frame Bcont	4A	4A
58	AWB B DWN LMT	AWB incoming frame Bcont lower value	1B	1B
59	AWB LL LMT	Low luminance intensity limiter	06	06
5A	AWB T M DIVID	AWB incoming frame upper, middle border value	5E	5E
5B	AWB B M DIVID	AWB incoming frame middle, lower border value	39	39
5C	AWB DELAY TM	AWB tracking speed Data: Adjustment mode 01: High speed tracking mode 0E: Normal	0E	0E
5D	AWB FAST TM	AWB initial high speed tracking amount	40	40
5E	AWB OUT HYS OFF	AWB outdoor hysteresis off difference	0C	0C
5F	AWB OUT B HYS	AWB outdoor hysteresis amount	06	06
60	AWB MODE	AWB adjustment mode Data: Adjustment mode 00: Normal D0: AWB adjustment mode F1: Sampling display mode	00	00
61	AE REFL	Reference value (lower) for AE	00	00
62	AE REFH	Reference value (upper) for AE	1E	1E
63	AGC MIN	AGC MIN value (AGCREF value), IRIS level adjustment	E3	
64	AE MIML	Low luminance intensity side limiter (MAXGAIN), MAX GAIN adjustment	32	
65	AE MAXL	High luminance intensity side limiter (lower)	80	80
66	IRIS OFFSET	Iris ROM table OPEN side off set	D0	D0
67	AE KEISU	Correction coefficient during detection weighting	00	00
68	AE FUNCTION	SW for turning each AE function ON and OFF	00	00
69	BL HOSEIH	Forcible back light level setting (upper)	40	40
6A	JITEISU DOWN	Constant during loop response DOWN side	30	30
6B	JITEISU UP	Constant during loop response UP side	10	10
6C	AE KNEE	KNEE setting value for AE	FF	FF
6D	ORETEN SET	Variable point due to time constant error amount	13	13

Table 7-2 (3).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
6E	OMOMIOUT	Outer frame weighting amount	40	40
6F	AFC WIDE	Coefficient required for the ANF integral loop	03	03
70	AFC GAIN	Loop gain of the flickerless loop	01	01
71	AFC LIMIL	Limiter corresponding to the error rate (Lower)	60	60
72	HIST P KEISU	Histocomp level setting P for counter light determination	20	20
73	HIST H KEISU	Histocomp level setting H for counter light determination	E0	E0
74	HIST L KEISU	Histocomp level setting L for counter light determination	90	90
75	GYKOU JITEISU	Constant during auto back light response	08	08
76	SUBN LIMIT	Limiter for counter light determination	40	40
77	FUZZY RULE1	Correction amount 1 for auto back light	90	90
78	FUZZY RULE2	Correction amount 2 for auto back light	C0	C0
79	FUZZY RULE3	Correction amount 3 for auto back light	B0	B0
7A	FUZZY RULE4	Correction amount 4 for auto back light	A0	A0
7B	FUZZY RULE5	Correction amount 5 for auto back light	70	70
7C	FUZZY RULE6	Correction amount 6 for auto back light	80	80
7D	FUZZY RULE7	Correction amount 7 for auto back light	A0	A0
7E	FUZZY RULE8	Correction amount 8 for auto back light	98	98
7F	FUZZY RULE9	Correction amount 9 for auto back light	90	90
80	FUZZY RULE10	Correction amount 10 for auto back light	78	78
81	IRIS MIN L	Iris limit value for small iris (Lower)	80	80
82	IRIS MIN H	Iris limit value for small iris (Upper)	02	02
83	DELTA SHUTGAIN	Smoothing amount setting	04	04
84	AE WAKUH	Frame data for AE detection (vertical line)	0F	0F
85	AE WAKUV	Frame data for AE detection (horizontal line)	4F	4F
86	WIDE LIMIT	ZOOM limiter WIDE (lower) Flange back adjustment	00	
87	WIDE LIMITH	ZOOM limiter WIDE (upper)	00	
88	TELE LIMIT	ZOOM limiter TELE (lower)	00	
89	TELE SIMITH	ZOOM limiter TELE (upper)	04	
8A	STEP ZERO	Flange back value	80	
8B	STEP ZERO SPAN (VAP ONLY)	Flange back value 2	00	00
8C	ZOOM SPD FAST	Zoom speed (fast)	18	18
8D	ZOOM SPD SUPER	Zoom speed (For adjustment)	7D	7D
8E	ZS INIT SLOW	Zoom speed initial value (slow)	7D	7D
8F	ZS INIT FAST	Zoom speed initial value (fast)	C9	C9
90	ZMSPD DAMIN	Zoom speed D/A MIN value	3D	3D
91	ZS K	Zoom servo coefficient K	12	12
92	ZS L	Zoom servo coefficient L	02	02
93	ZP HYS	Zoom potential hysteresis	05	05
94	MOTOR ABILITY	Step motor MAX SPEED	08	08
95	AF MD2THL	MODE2 THR	20	20
96	MAXCHG THR	MAX value renewal THR	1A	1A
97	ERR THL	Wobbling width THR	18	18
98	WOB INTV	Wobbling second interval	04	04
99	ERRPOL THR	MODE2 error possible THR	13	13

Table 7-2 (4).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>9A</td><td>MAXCHK THR</td><td>MAX CHECK THR</td><td>12</td><td>12</td></tr>
<tr><td>9B</td><td>REWOB THR</td><td>Wobbling second THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9C</td><td>MODE2 INOUT</td><td>MODE2 speed switchover</td><td>80</td><td>80</td></tr>
<tr><td>9D</td><td>SMLWD THR</td><td>Small frame THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9E</td><td>ZOOM PULSE LIMIT</td><td>Maximum zoom pulse value</td><td>C9</td><td>C9</td></tr>
<tr><td>9F</td><td>ZOOM RIZE</td><td>Zoom rise minimum speed time</td><td>0A</td><td>0A</td></tr>
<tr><td>A0</td><td>FB CURVEPEAKL</td><td>Constant for flange back adjustment</td><td>00</td><td>00</td></tr>
<tr><td>A1</td><td>FB CURVEPEAKH</td><td>Constant for flange back adjustment</td><td>72</td><td>72</td></tr>
<tr><td>A2</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>D2</td><td>D2</td></tr>
<tr><td>A3</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>03</td><td>03</td></tr>
<tr><td>A4</td><td>LIMITREST WIDE</td><td>Zoom limiter WIDE side</td><td>10</td><td>10</td></tr>
<tr><td>A5</td><td>LIMITREST TELE</td><td>Zoom limiter TELE side</td><td>5A</td><td>5A</td></tr>
<tr><td>A6</td><td>FB PEAKTHR</td><td>Constant for flange back adjustment</td><td>80</td><td>80</td></tr>
<tr><td>A7</td><td>FB FOCUSZERO</td><td>Constant for flange back adjustment</td><td>D8</td><td>D8</td></tr>
<tr><td>A8</td><td>DET IRIS ALT</td><td>Iris variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>A9</td><td>DET AGC ALT</td><td>AGC variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>AA</td><td>LIMIT INSURANCE</td><td>Focus limiter insurance value</td><td>05</td><td>05</td></tr>
<tr><td>AB</td><td>FOCUS MODE</td><td>Focus mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>08</td><td>Zoom, Focus fixed</td></tr>
<tr><td>00</td><td>Normal</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AC</td><td>LENS ADJ MOD</td><td>Flange back adjustment mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Nomal</td></tr>
<tr><td>01</td><td>Flange back adjustment</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AD</td><td>ELENS EMRG</td><td>Lens emergency</td><td>00</td><td>00</td></tr>
<tr><td>AE</td><td>NTSC PAL/H DEF</td><td>DELAY bit=0: NTSC, 1: PAL, bit4-7=CCD correction delay</td><td>24</td><td>24</td></tr>
<tr><td>AF</td><td>FT SW</td><td>DDS display mode switchover
<table>
<tr><th>Data</th><th>DDS display mode</th></tr>
<tr><td>00</td><td>Y sampling display</td></tr>
<tr><td>03</td><td>R–Y, B–Y display</td></tr>
<tr><td>40</td><td>HALL data display</td></tr>
<tr><td>82</td><td>R ratio display</td></tr>
<tr><td>83</td><td>b ratio display</td></tr>
<tr><td>91</td><td>R.B ratio (M) display</td></tr>
<tr><td>B0</td><td>Focus step display</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>B0</td><td>CORE OTHER</td><td></td><td>12</td><td>12</td></tr>
<tr><td>B1</td><td>CORE YGAIN</td><td>Core field data 0 byte gain</td><td>3F</td><td>3F</td></tr>
<tr><td>B2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B3</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B4</td><td>ZOOM DROP 1</td><td>F-No. dropping (1) by zoom lens</td><td>00</td><td>00</td></tr>
<tr><td>B5</td><td>ZOOM DROP 2</td><td>F-No. dropping (2) by zoom lens</td><td>95</td><td>95</td></tr>
<tr><td>B6</td><td></td><td></td><td></td><td></td></tr>
</table>

Table 7-2 (5).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
B7				
B8				
B9				
BA	AWB IN B HYS	Hysteresis of AWB indoor (BLUE)	04	04
BB	AWB IN R HYS	Hysteresis of AWB indoor (RED)	02	02
BC				
BD				
BE	MF STEP CHNGE	MODE 2 THR coefficient	06	06
BF	ZOOM SPEED SUPER SLOW	Zoom speed (Super slow speed)	08	08
C0	ZOOM INT SUPER SLOW	Zoom speed initial value (Super low speed)	7D	7D
C1	AF CONTROL FLAG		2C	2C
C2	AE Y THR	Low luminous intensity AE Y THR1	40	40
C3	AE Y MIN	Low luminous intensity AE Y THR2	18	18
C4	MD2 SPD	Focus speed at MODE 2	41	41
C5	AE CHECK	THR for activating re-start up from MODE 7, 8	30	30
C6	LOWCON THR1	THR1 for judging LOW CON at MODE 2	10	10
C7	LOWCON THR2	THR2 for judging LOW CON at MODE 2	20	20
C8~EF		Not used		
F0		Input column of the unit ID No., etc. Not related to unit operations.	FF	
F1			FF	
F2			FF	
F3			FF	
F4			FF	
F5			FF	
F6			FF	
F7			FF	
F8			FF	
F9			FF	
FA			FF	
FB			FF	
FC			FF	
FD			FF	
FE			FF	
FF			FF	

Table 7-2 (6).

7-1-6. 6 Page, 1 Page Address List

The camera adjustment mode can be set by performing the following data settings at page: 6 or page: 1. (These page data can be set temporary, but when the main power (6.3V) is turned off, the original value (normal value) will be returned. Therefore, these adjustment modes can be released very simply by turning the main power off.)

(Example) The camera adjustment mode (window OFF) is set by setting data: 01 to page: 6, address: 00. The F page write protect will also be released.

1. Page 6

Address	Adjustment Mode	Data	Function
00	Camera adjustment mode	01 10 11	Camera adjustment mode (window OFF), F page write protect released Normal Camera adjustment mode (window ON), F page write protect released
01	Camera adjustment switch **Note:** To set this address adjustment mode, it is necessary to press the PAUSE button of the adjusting remote control unit after setting the data.	00 01 03 05 07 09 0B 0D 0F 11 13 15 1F	Normal IRIS OPEN, AGC HOLD IRIS CLOSE1, AGC HOLD IRIS CLOSE2, AGC MIN IRIS CLOSE3, AGC MAX ND0.5 SHUTTER (PAL=1/160, NTSC=1/190) ND0.8 SHUTTER (PAL=1/320, NTSC=1/380) AWB PRESET1: 3200K PRESET DATA take in WB 3200K PRESET: Indoor white balance mode AWB PRESET2: 3200K PRESET DATA take in ZOOM HUNTING1 ZOOM SPDSLOW ZOOM HUNTING2 ZOOM SPDFAST EEPROM PRE WRITE: Page F initial data write
05	Shutter mode	00 15	NTSC=1/60, PAL=1/50 NTSC=1/2000, PAL=1/2000
08	ZOOM speed SLOW/FAST	00 01 02 03	Normal ZOOM speed SLOW (10 second) ZOOM speed FAST (3.5 second) ZOOM speed SLOW (10 second)
09 ★	COMPLEATED FLAG	00 01	Camera Adjustment not completed Camera adjustment completed
11 ★	ROM VERSION	05	Camera micro processor ver5

Addresses with ★ are exclusively for reading.

Table 7-3.

2. Page 1

Address	Adjustment Mode	Data	Function
E6	VH address L		Title horizontal/vertical position (L)
E7	VH address H		Title horizontal/vertical position (H)

Table 7-4.

7-1-7. Adjustment Connector

Most of the measuring points for the camera section adjustment are concentrated on CN701 of the CS-37 board. Connect the oscilloscope and etc. via the measuring pin (J-6082-139-A). The following table lists the terminal numbers and the signal names of CN701.

Terminal Number	Signal Name	Terminal Number	Signal Name
1	EVER 5V	2	NC
3	ZOOM SW	4	CAM SI
5	$\overline{\text{CS ROM}}$	6	CAM SO
7	$\overline{\text{CS OPD}}$	8	$\overline{\text{CAM SCK}}$
9	$\overline{\text{CS CORE}}$	10	GND
11	IRIS OUT	12	NC
13	V SUB CHK	14	C OUT
15	PG CONT	16	GND
17	NC	18	Y OUT

Table 7-5.

7-1-8. Data Processing

The calculation of the DDS display and the adjusting remote control unit display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-6. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

The lower digits of the hexadecimal notation The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① B (b)	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table 7-6.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (PS-308 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ⑰ and ⑱ of CN950
Specified value	4.98 ± 0.15 Vdc
D4V check	
Measurement point	Pins ⑮ and ⑯ of CN950
Specified value	4.03 ± 0.15 Vdc
CAM 5V check	
Measurement point	Pins ⑬ and ⑭ of CN950
Specified value	4.90 ± 0.15 Vdc
15V check	
Measurement point	Pin ⑪ of CN950
Specified value	15.04 ± 0.4 Vdc
–9V check	
Measurement point	Pin ⑫ of CN950
Specified value	–8.5 ± 0.4 Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Check that the data of page: 6, address: 09 is 00.
   (Display indicating that page F data can be initialized)
3) Set data: 1D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Page F data initialization execution.
   The data of all addresses of page F will be initialized.)
4) Check that the data of page: 6, address: 09 is 01.
   (Displays that the initialization of page F data has been completed)
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote control unit.
   (Releases the page F data initialization mode)
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data are different from the initial data for adjustment. Change the data by manual input, and arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote control unit every time the new data is set.

Address	Data
00 (ID)	3A
62 (AE REF H)	1E
94 (ZOOM SPD SLOW)	08
A5 (LIMITREST TELE)	5A
BF (ZOOM SPEED SUPER SLOW)	08

[Distinguishing the Camera Micro Computer (IC709) Versions]

Each version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 11.

Version	Part Name	Page: 6 Address: 11
Ver.5	CXP80624-299Q	05

4. 28 MHz Original Oscillation Adjustment (CS-37 board)

Subject	Not required
Measurement Point	CL821 (pin (57) of IC801)
Measuring Instrument	Frequency counter
Adjusting Element	CT801
Specified Value	14318181 ± 71 Hz

Adjusting method:

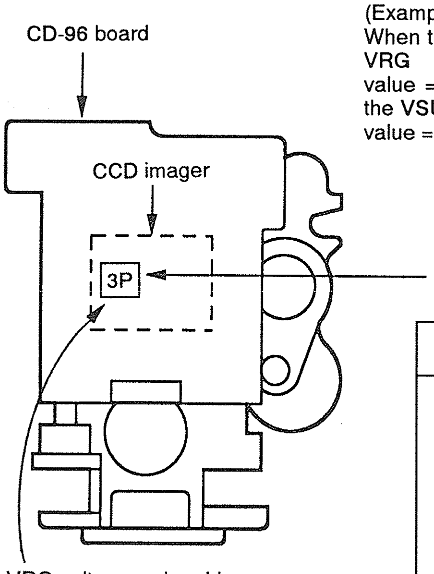
1) Use CT801 to adjust the oscillation frequency to 14318181 ± 71 Hz.

5. V SUB Adjustment (CS-37 board)

Subject	Not required
Measurement Point	Pin ⑬ of CN701 (V SUB CHK)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	04 (V SUB)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 04, and adjust the voltage of pin ⑬ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.



(Example)
When the display is 3P, the VRG voltage specified value =2.0 ± 0.1 Vdc, and the VSUB voltage specified value =13.5 ± 0.1 Vdc.

VSUB voltage code address

Code address	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

VRG voltage code address

Code address	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

Fig. 7-7.

6. VRG Adjustment (CS-37 board)

Subject	Not required
Measurement Point	Pin ⑮ of CN701 (PG CONT)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	05 (VRG)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 05, and adjust the voltage of pin ⑮ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.

7. CCD Imager Correction Data Write

Subject	Not required
Adjustment Page	F
Adjustment	1D to 2C (CCD-DEFECT)

Perform CCD imager correction data write in the following cases.

1. When the CCD imager has been replaced
2. The ocassion of exchaning a camera micro processor or EEPROM (IC712).
3. When the page F data has been initialized

In the case of 1, as the correction data is not required for the CCD imager for repair, adjust all data of addresses 1D to 2C to “00”.

In the case of 2 and 3, write the correction data attached to the shield case of PS-308 board to addresses 1D to 2C.

If the correction data are not attached, adjust all data of addresses 1D to 2C to “00”.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Write the correction data to page: F, addresses: 1D to 2C.
   Note: To perform write to the non-volatile memory, press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) If the CCD imager has been replaced, remove the old correction data label attached on the shield case (UPPER) of PS-308 board.

8. HALL Adjustment

Subject	Not required
Measurement Point	DDS display of EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	08 (HALL GAIN) 09 (HALL OFFSET)
Specified Value	31 TO 35 during IRIS OPEN B1 to B5 during IRIS CLOSE

Adjusting method:

1) Release the protect.
Page: 6, address: 00, data: 01
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(HALL output display mode setting)
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
4) Set data: 40 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W_2.
6) Set data: 30 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
7) Read the DDS display data, and set to W_1.
8) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS OPEN mode setting)
9) Read the DDS display data, and set to K_1.
10) Set data: 40 to page: F, address: 08, and press the PAUSE button.
11) Read the DDS display data, and set to K_2.
12) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table".)
13) Calculate X_1' using the following equations (decimal notation calculation).

$$A'=W_2'+K_1'-W_1'-K_2' \cdots\cdots\cdots \text{Equation 1}$$

$$B'=W_1'-K_1' \cdots\cdots\cdots \text{Equation 2}$$

$$X_1'=\frac{2048+(48\times A')-(16\times B')}{A'} \cdots\cdots\cdots \text{Equation 3}$$

14) Convert X_1' to hexadecimal notation, and obtain X_1.
(Round off to one decimal place)
15) Set data: X_1 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
16) Change the data of page: F, address: 09, and adjust the DDS display data to "33".
17) Press the PAUSE button of the adjusting remote control unit.
18) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS CLOSE mode setting)
19) Read the DDS display data, and set to W_0. If W_0 lies within the "B1" to "B5" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
20) Convert W_0 to decimal notation, and obtain W_0'.
21) Calculate X_2' using the following equations (decimal notation calculation).

$$C'=W_0'-B'-51 \cdots\cdots\cdots \text{Equation 4}$$

$$X_2'=\frac{(128-B')\times(X_1'-48)+48\times C'}{C'} \cdots\cdots\cdots \text{Equation 5}$$

(X_1' and B' are values obtained from equations 2 and3)
22) Convert X_2' to hexadecimal notation and obtain X_2.
(Round off to one decimal place)
23) Set data X_2 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
24) Change the data of page: F, address: 09, and adjust the DDS display data to "B3".
25) Press the PAUSE button of the adjusting remote control unit.
26) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS OPEN mode setting)
27) Check that the DDS display data lies within the "31" to "35" range.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(IRIS NORMAL mode setting)

9. Flange Back Adjustment

Subject	Chart for flange back adjustment (1000 ± 5 mm from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	8A (STEP ZERO), 86 (WIDE LIMIT), 87 (WIDE LIMIT H), 88 (TELE LIMIT), 89 (TELE LIMIT H)

Adjusting method:

1) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Check that the data of page: 6, address: 09 is 00.
   (Flange back adjustment possible display)
4) Check that the page: F, address: 86 to 8A data is the initial value. (Refer to Table 7-2. "Page F address list".)
5) Set data: 01 to page: F, address: AC.
   (This causes automatic adjustment to be performed. Adjustments are performed at the zoom lens TELE end first, and then at the WIDE end. The adjustment data is automatically input to page: F, addresses: 86 to 8A.)
6) Check that the data of page: 6, address: 09 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Set data: 00 to page: F, address: AC.
2) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (1m from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	$D_2=D_1 \pm 5$ $D_4=D_3 \pm 5$

Checking method:

1) Set data: 11 to page: 6, address: 00. (Camera adjustment (Window ON) mode)
2) Set data: B0 to page: F, address: AF. (Focus step display mode)
3) Place the Siemens star 1m from the front of the lens.
4) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
5) Turn off the auto-focus. (Note 1.)

- Checking the flange back at the center point of the zoom.

6) Shoot the Siemens star with the zoom TELE end.
7) Adjust the focus. (Note 2.)
8) Adjust to the center point of the zoom.
   (Adjust to the center point by viewing the EVF zoom position.)
9) Read the focus step value (4 digits) displayed on the TV monitor, and take the value as D_1.
10) Adjust the focus. (Note 2.)
11) Read the focus step value here, and take the value as D_2.
12) Check that $D_2=D_1 \pm 5$.

- Checking the flange back at the zoom WIDE end.

13) Shoot the Siemens star at the zoom TELE end.
14) Adjust the focus. (Note 2.)
15) Adjust to the zoom WIDE edge.
16) Read the focus step value displayed on the TV monitor, and taken the value as D_3.
17) Adjust the focus. (Note 2.)
18) Read the focus step value here, and taken the value as D_4.
19) Check that $D_4=D_3 \pm 5$.

Process after checking

1) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
2) Turn off the main power supply (6.3V).

Note 1: How to turn off the auto focus.

1) While pressing the PUSH FOCUS HOLD button, set the FOCUS HOLD switch to HOLD position.

Note 2: How to adjust the focus when the auto focus off mode.

1) Set the HOLD switch of the adjusting remote control unit to the NORMAL position.
2) Adjust the focus with the manual focus buttons (🏔 and ▲) of the adjusting remote control unit.
3) Set the HOLD switch of the adjusting remote control unit to the ADJ (HOLD) position.

11. SYNC Level Adjustment (CS-37 board)

Subject	Not required
Measurement Point	Pin ⑱ of CN701 (Y OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	06 (VREF-Y)
Specified Value	A=140 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 06, and adjust so that the SYNC level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

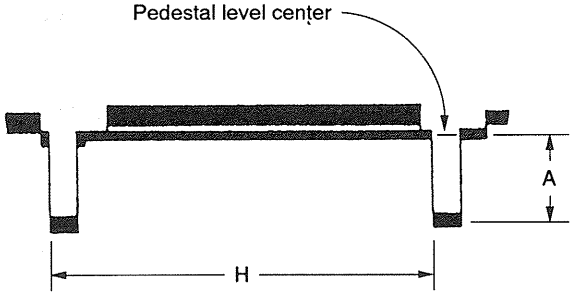


Fig. 7-8.

12. BURST Level Adjustment (CS-37 board)

Subject	Not required
Measurement Point	Pin ⑭ of CN701 (C OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	07 (VREF-C)
Specified Value	A=140 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 07, and adjust so that the burst level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

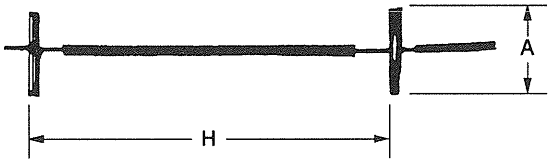


Fig. 7-9.

13. A/D Offset Adjustment

Subject	Not required
Measurement Point	DDS display on the EVF or the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	0C (AD REF)
Specified Value	40 to 41

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE AGC MIN mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Y sampling output mode setting)
4) Set data: 00 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Sets the SET UP level to 0)
5) Set data: 35 to page: 1, address: E6.
   (Setting 1 of the sampling position)
6) Set data: 6D to page: 1, address: E7.
   (Setting 2 of the sampling position)
7) Change the data of page: F, address: 0C, and adjust the average value of the DDS display (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor display) to 40 to 41.
   (Set the data of address 0C to the maximum value satisfying the specification.)
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 08 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Returns the SET UP level to the normal level.)
2) Turn the main power supply (6.3V) off.

14. Carrier Balance Adjustment

Subject	Not required
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	03 (CS SL)
Specified Value	The center of the black luminance point should lie within the 1 ϕ circle whose center is the principle point.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Set data: 07 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE, AGC MAX mode setting)
3) Change the data of page: F, address: 03, and adjust so that the center of the black luminance point coincides with the principle point.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

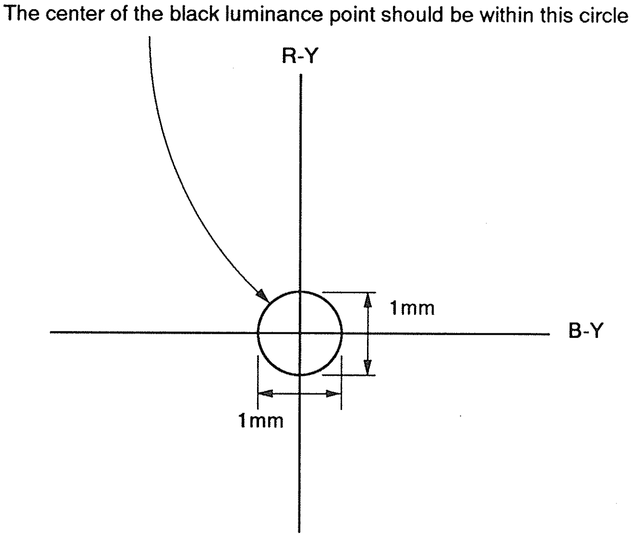

The center of the black luminance point should be within this circle
R-Y
1mm
B-Y
1mm

Fig. 7-10.

15. Picture Frame Setting

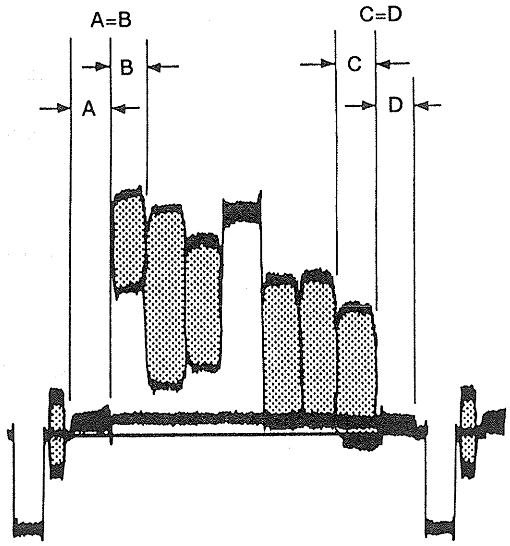
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Adjust the zoom and the camera direction, and set to the specified position.
2) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame" and "white pattern standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

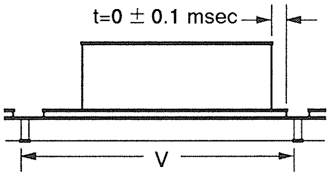


Fig. 7-11.

Check on the TV monitor

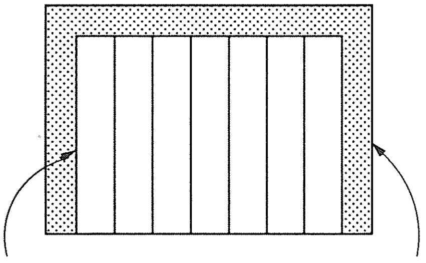

Color bar chart picture frame
TV monitor picture frame

Fig. 7-12.

16. IRIS Level Adjustment (CS-37 board)

Subject	Color bar standard picture frame
Measurement Point	Pin ⑪ of CN701 (IRIS OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	63 (AGC MIN)
Specified Value	A=230 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 63, and adjust so that the IRIS OUT signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

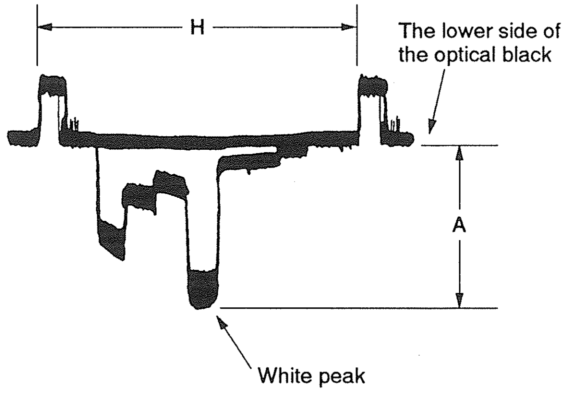

H
The lower side of the optical black
A
White peak

Fig. 7-13.

17. MAX GAIN Adjustment (CS-37 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	A=210 ± 5 mV

Adjusting method:

1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
2) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

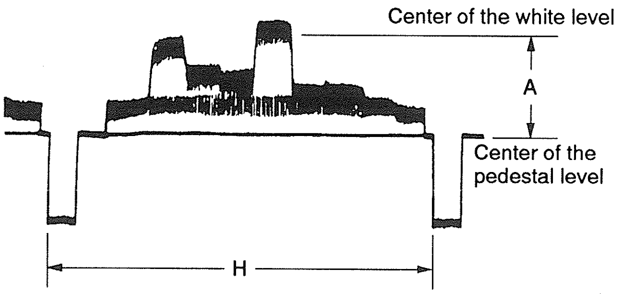


Fig. 7-14.

18. IRIS IN/OUT Adjustment

Subject	White pattern standard picture frame
Measurement Point	DDS display of the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	39 (AWB IRIS IN) 3A (AWB IRIS OUT)

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL data display)
3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.8 shutter mode setting)
4) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor), and set to D39.
5) Set data: D39 to page: F, address: 39, and press the PAUSE button of the adjusting remote control unit.
6) Set data: 09 to page 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.5 shutter mode setting)
7) Read the DDS display data and set to D3A.
8) Set data: D3A to page: F, address: 3A, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the ND0.8 shutter mode)

19. Pre-white Balance Adjustment

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33 (R CONT REF), 34 (B CONT REF)
Specified Value	The center of the white luminance point should lie within the circle with a diameter of 1mm and whose center is the principle point

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(WB 3200K preset mode setting)
2) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
3) Change the data of addresses:33 and 34 of page: F alternately, and coincide the white luminance point to the principle point.
Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
If not, the new data will not written to the memory.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Release of the preset mode)
2) Set data: 10 to page: 6, address: 00.
(Protect mode setting)

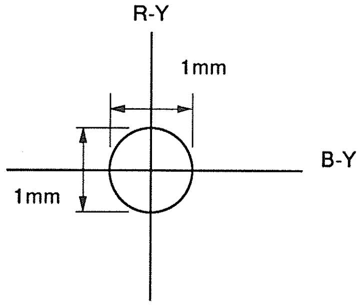


Fig. 7-15.

20. Color Reproduction Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	18 (CORE B–Y GAIN), 19 (CORE R–Y GAIN), 1A (CORE R–Y HUE), 1B (CORE B–Y HUE)
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Indoor white balance mode setting)
2) Set data: 01 to page: 6, address: 00.
(Camera adjustment mode (Window OFF) setting)
3) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
4) Change the data of addresses 18 to 1B of page: F, and settle each color luminance point in each color reproduction frame.
Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
If not, the new data will not be written to the memory.
5) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01.
(Release of the adjustment mode)
2) Set data: 10 to page: 6, address: 00.
(Protect mode setting)

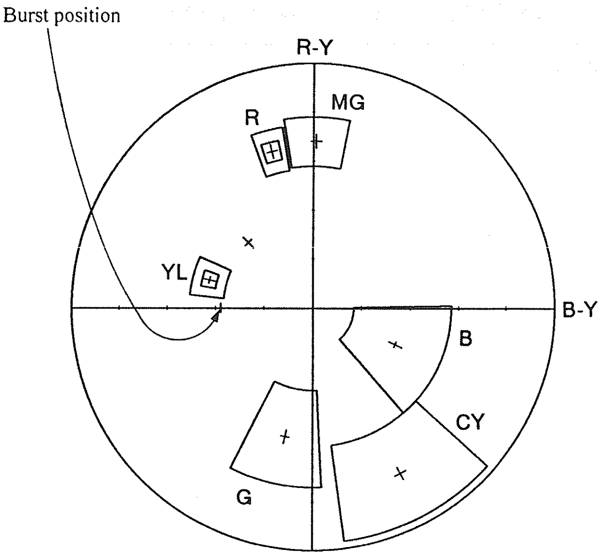


Fig. 7-16.

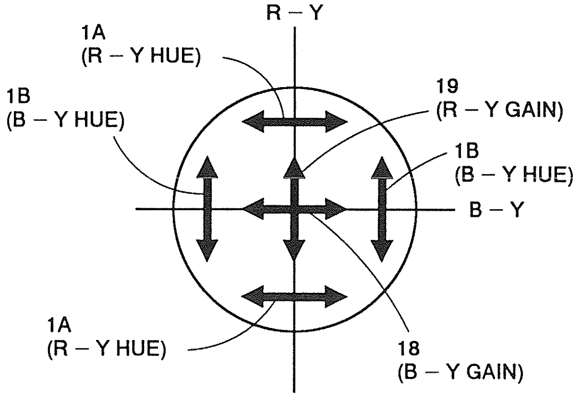


Fig. 7-17. Direction of the Movements of the Adjustment Address and Luminance Point

21. Auto White Balance Preset Adjustment

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	2D (R REF L), 2E (R REF H), 2F (G REF L), 30 (G REF H), 31 (B REF L), 32 (B REF H)

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Check that the data of page: 6, address: 09 is 00.
(Auto white balance preset adjustment possible display)
3) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(3200K preset data take in preparation mode)
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(When the 3200K preset data is taken in, the data will be automatically input to addresses 2D to 32 of page F.)
7) Check that the data of page: 6, address: 09 is 01.
(Auto white balance preset adjustment completion display)

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Release of the auto white balance preset mode)
2) Set data: 10 to page: 6, address: 00.
(Release of camera adjustment mode)

22. Auto White Balance Adjustment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	35 (AWB NORM R) 36 (AWB NORM B)
Specified Value	R ratio 2980 ± 40 B ratio 5C80 ± 40

Note: Check that "Auto white balance preset adjustment" has been completed.

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
2) Set data: D0 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
(Auto white balance adjustment mode setting)
3) Set data: 82 to page: F, address: AF.
(R ratio display mode setting)
4) Change the data of page: F, address: 35, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to 2980 ± 40.
5) Press the PAUSE button of the adjusting remote control unit.
6) Set data: 83 to page: F, address: AF.
(B ratio display mode setting)
7) Change the data of page: F, address: 36, and adjust the average value of the DDS display data to 5C80 ± 40.
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
(Release of the white balance adjustment mode)
2) Set data: 10 to page: 6, address: 00.
(Release of camera adjustment mode)

23. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-18. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-18.A.
   (Indoor white balance check)
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance mode setting)
6) Set data: 01 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance high speed tracking mode setting)
7) Set data: 91 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R, B ratio (M) display mode setting)
8) Check that the top 2 digits and the bottom 2 digits of the DDS display are 3D to 43.
9) Check that the center of the white luminance point is within the circle shown in Fig. 7-18. A.
10) Place the C14 filter on the lens.
11) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. B.
    (Auto white balance outdoor mode check)
12) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
13) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. C.
    (Auto white balance outdoor mode check)

Processing after completing adjustments

1) Set data: 10 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance fast tracking mode)
2) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R, B ratio (M) display mode)
3) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

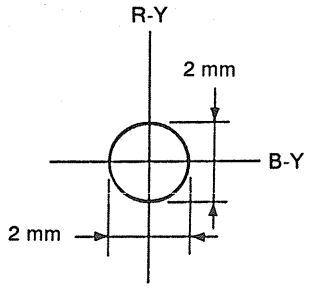


Fig. 7-18. A

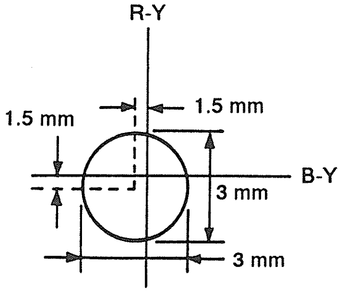


Fig. 7-18. B

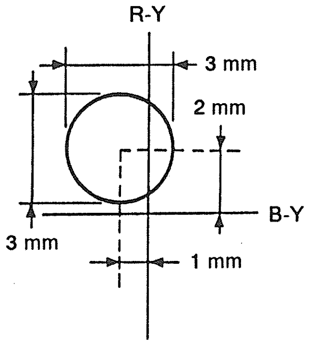


Fig. 7-18. C

24. Linear Matrix Adjustment

Subject	Color bar standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3D (DMAT HUE) 3E (DMAT GAIN)

Note 1: Check that position that was set in the color bar chart picture frame "15. Picture Frame Setting" is maintained, before beginning adjustments.

Adjusting method:

1) Remove the filter C14 for color temperature correction.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Color bar data sampling mode setting
   1. Check that the data of page: 6, address: 01 is 00.
   2. Set data: F1 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   3. Set data: 2E to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Check that the colors on the monitor display at the color modulation stop mode have disappeared)
4) Specifying the Yellow position
   1. Set data: C9 to page: 1, address: E6.
   2. Set data: B6 to page: 1, address: E7.
5) Set data: 03 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R–Y, B–Y data display mode setting)
6) Read the average value of the DDS display data (Note 2.), and set to Y_1.
7) Specifying the Red position
   1. Set data: 59 to page: 1, address: E6.
   2. Set data: 6D to page: 1, address: E7.
8) Read the average value of the DDS display data (Note 3.), and set to R_1.
9) Place the filter C14 for color temperature correction on the lens. (Ensure that the picture frame of the chart does not shift at this time.)
10) Specifying the yellow position.
   1. Set data: C9 to page: 1, address: E6.
   2. Set data: B6 to page: 1, address: E7.
11) Read the average value of the DDS display data (Note 2.), and set to Y_2.
12) Convert Y_1, R_1, Y_2 to decimal notation to obtain Y_1', R_1' and Y_2'.
   (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
13) Calculate X_1' from the following equation (decimal notation calculation).
   $X_1'=Y_2'-Y_1'$
14) Calculate D3D from the following table
   (D3D is hexadecimal notation)

X_1' value	**D3D**
$-1 \leqq X_1' \leqq 1$	F0
$X_1' > 1$	F1
$X_1' < -1$	FF

15) Set data: D3D to page: F, address: 3D, and press the PAUSE button of the adjusting remote control unit.
16) Specifying the Red position
   1. Set data: 59 to page: 1, address: E6.
   2. Set data: 6D to page: 1, address: E7.
17) Read the average value of the DDS display data (Note 3.), and set to R_2.
18) Convert R_2 to decimal notation to obtain R_2'.
19) Calculate X_2' from the following equation (decimal notation calculation).
   $X_2'=R_2'-R_1'$
20) Calculate D3E from the following table.

X_2' value	**D3E**
$X_2' \geqq 0$	00
$0 > X_2' \geqq -1$	01
$-1 > X_2'$	02

21) Set data: D3E to page: F, address: 3E, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the sampling mode)
2) Set data: 2C to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Color modulation ON mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R–Y, B–Y data display mode)
4) Turn the main power supply (6.3V) off.

Note 2: The right two digits of the display data at the bottom right of the EVF or monitor TV.

Note 3: The left two digits of the display data at the bottom right of the EVF or monitor TV.

25. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=680 ± 40 mV SYNC level=285 ± 20 mV BURST level=280 ± 30 mV

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

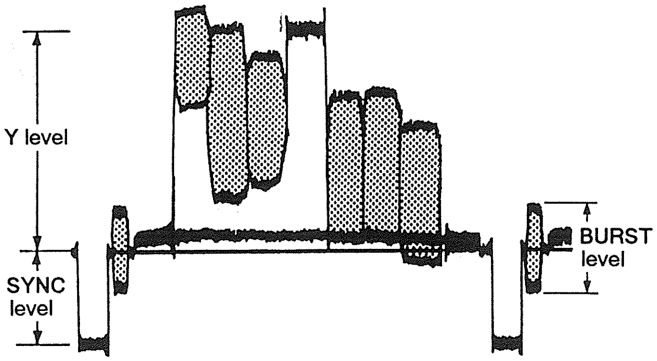


Fig. 7-19.

7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (VF-44 BOARD)

7-3-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-21.

Adjustment method:

1) Adjust RV503 (BRIGHT) for appropriate brightness on CRT screen.
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-20.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

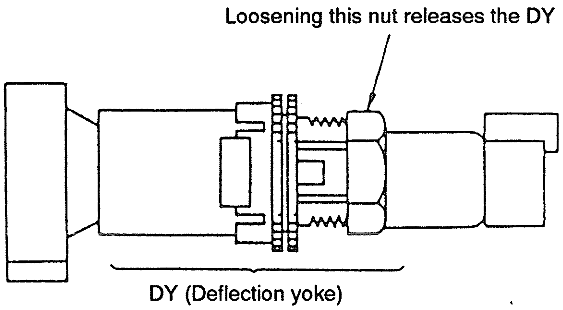
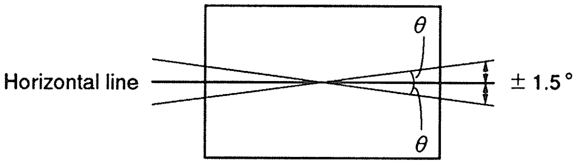


Fig. 7-20.



Specified value: Image orientation within ± 1.5 ° of horizontal line.

Fig. 7-21.

7-3-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Specified Value	See Fig. 7-23.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-22.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360 ° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

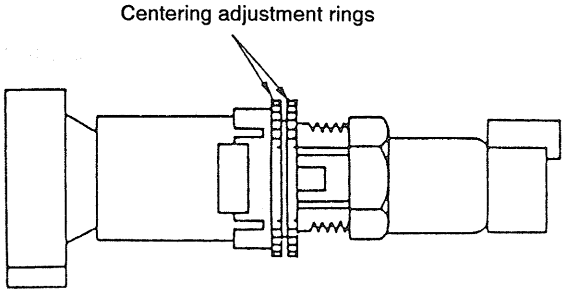


Fig. 7-22.

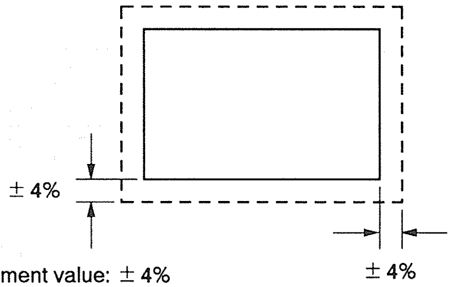


Fig. 7-23.

7-3-3. AFC Adjustment (VF-44 Board)

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C517 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV504 (AFC)
Specified Value	2.30 ± 0.05 Vdc

Adjustment method:

1) Adjust RV504 (AFC) for 2.30 ± 0.05 Vdc.

7-3-4. Horizontal Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	C504
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by RV505 (V SIZE).
2) Rotate RV503 (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern $\boxed{A}$ of the H size adjustment capacitor (C504) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-25.)

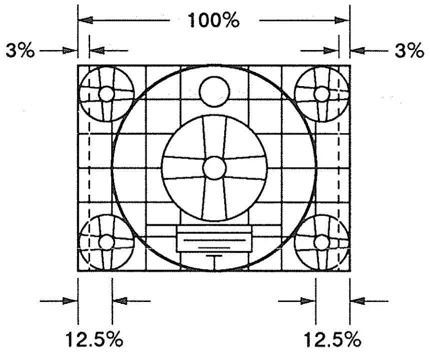
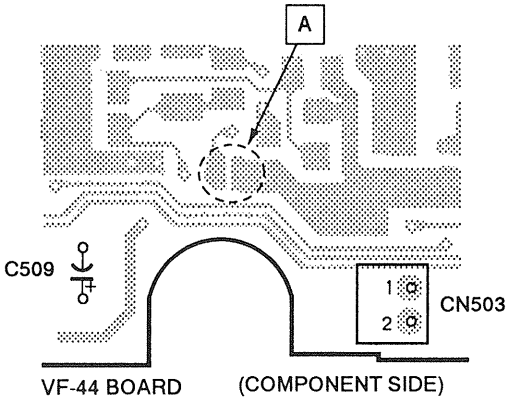


Fig. 7-24.



A section	H size
Short	Large
Open	Small

Fig. 7-25.

7-3-5. Vertical Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV505 (V SIZE)
Specified Value	5 ± 3%

Adjustment method:

1) By turning RV505 (V SIZE), adjust vertical overscan to 5 ± 3% (upper and lower total).

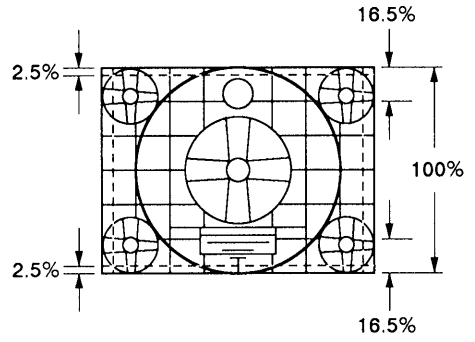

16.5%
2.5%
100%
2.5%
16.5%

Fig. 7-26.

7-3-6. Focus Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	RV502 (FOCUS)

Adjustment method:

1) Adjust to the best focus point with RV502.

7-3-7. Brightness, Contrast Adjustments (VF-44 Board)

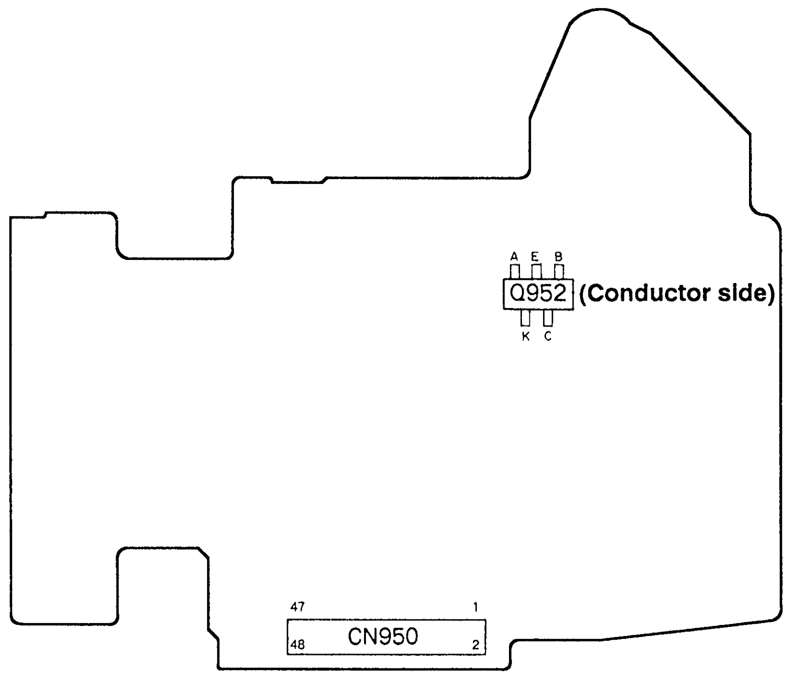
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5NSP) Monoscope portion
Adjustment Element	Brightness: RV503 (BRIGHT) Contrast: RV501 (CONT)

Adjustment method:

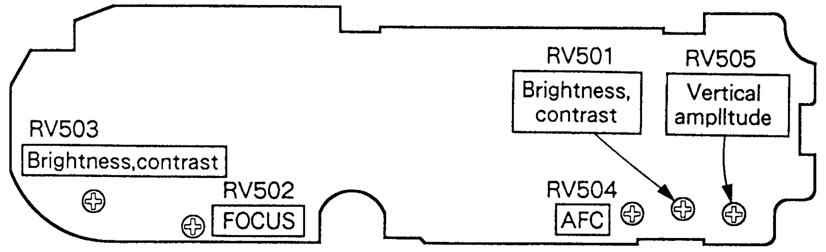
1) Adjust RV503 (BRIGHT) and RV501 (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

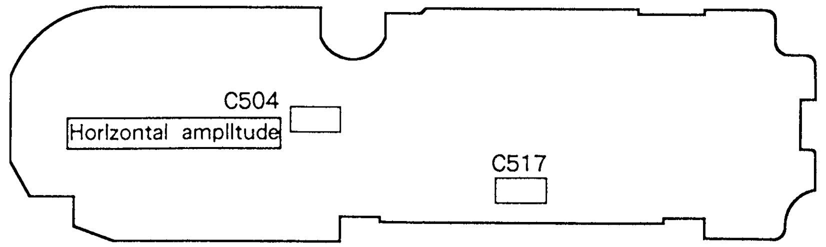
PS-308 BOARD (COMPONENT SIDE)


A E B
Q952 (Conductor side)
K C
47
1
48
CN950
2

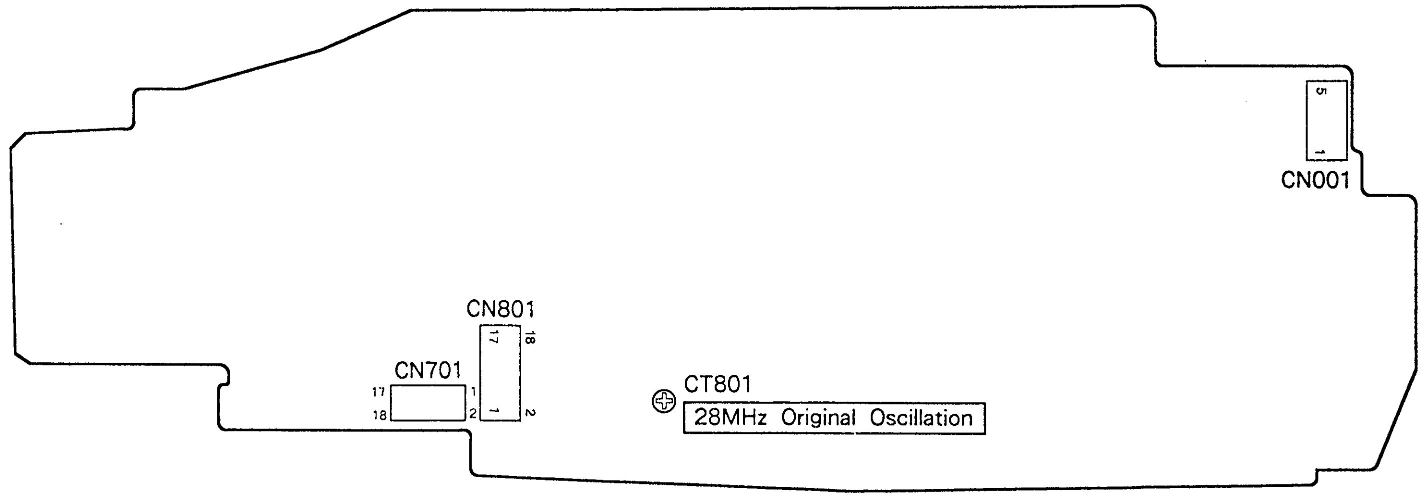
VF-44 BOARD (COMPONENT SIDE)


RV501
Brightness, contrast
RV505
Vertical amplitude
RV503
Brightness,contrast
RV502
FOCUS
RV504
AFC

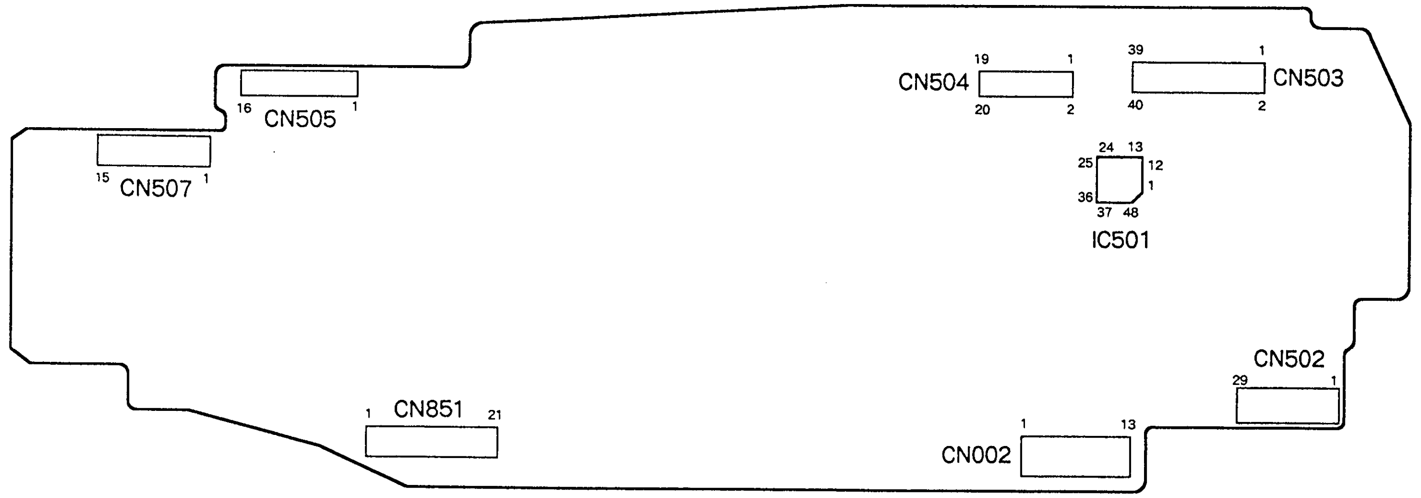
VF-44 BOARD (CONDUCTOR SIDE)


C504
Horizontal amplitude
C517

CS-37 BOARD (COMPONENT SIDE)


5
1
CN001
CN801
17
18
1
2
CN701
17
18
1
2
CT801
28MHz Original Oscillation

CS-37 BOARD (CONDUCTOR SIDE)


16
CN505
1
15
CN507
1
19
1
CN504
20
2
39
1
CN503
40
2
24
13
25
12
1
36
37
48
IC501
CN502
29
1
1
CN851
21
1
13
CN002

PAGES 206-208 LEFT BLANK INTENTIONALLY

SECTION 8
MECHANICAL SECTION ADJUSTMENTS

For Mechanical Adjustments

Refer to the separate volume of mechanical adjustment "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV (A Mechanism)" for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-973-199-11)

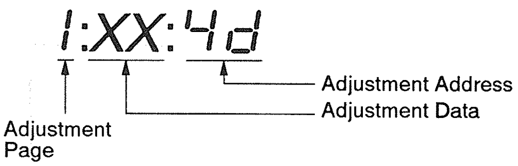
For setting of the track shift mode, however, refer to the following.

8-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Set page: 1, address: 01 and data: 01, and then release the protector.
3) Set page: D and address: 01.
4) Set adjustment data to 03 (test mode 3) by PLAY or STOP button.
   (When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)
5) Set to the HOLD OFF side in order to set the normal mode.



8-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.
   CH1: CS-37 board CN001 pin ③ (PB RF)
   CH2: CS-37 board CN001 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1NP: 8-967-995-02).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. If not flat, make adjustment as follows. (Refer to Fig. 8-1 and 8-2)

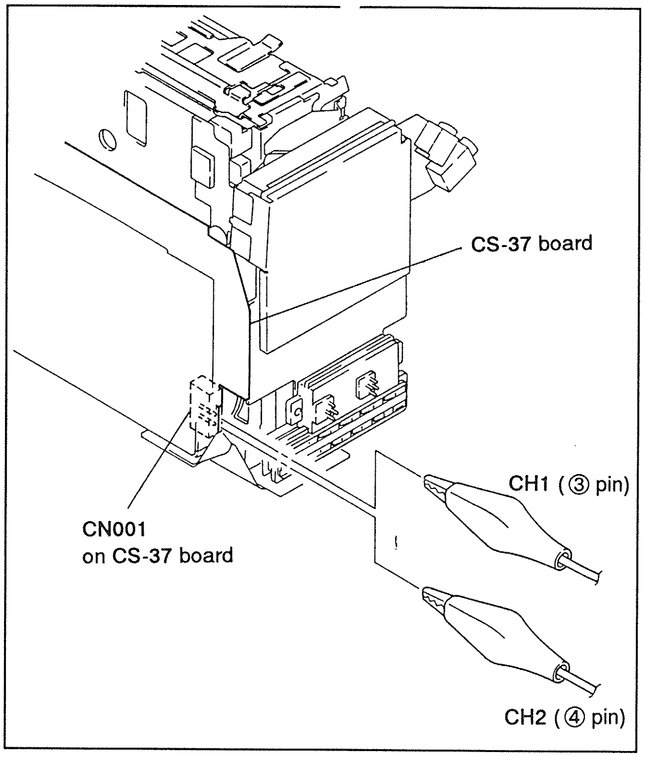


Fig.8-1.

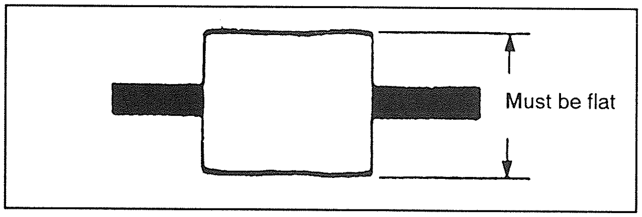


Fig.8-2.

SECTION 9
VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 236.

9-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

9-1-1. Equipments to be used

1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1NP)
    Part Code: 8-967-995-02
    For video frequency characteristics adjustment (WR5-6N)
    Part Code: 8-967-995-12
    For checking operations
    (WR5-4NL)$^{\text{Note 1}}$
    Part Code: 8-967-995-51
    (WR5-5NSP)$^{\text{Note 2}}$
    Part Code: 8-967-995-42
    Note: The following alignment tapes can also be used.
    1) WR5-3NL (8-967-995-31)
    2) WR5-4NSP (8-967-995-41)
12) Remote control unit for adjustment (J-6082-053-A)
13) VA-77 board extension cord (20P, 0.8 mm)
    Part Code: J-6082-169-A
14) VA-77 board extension cord (40P, 0.8 mm)
    Part Code: J-6082-168-A
15) Mecha deck extension cord (30P, 0.8 mm)
    Part Code: 6082-167-A

9-1-2. Connecting the equipments

Unless specified otherwise, connect the measuring instruments as shown in Fig. 9-1 and perform the adjustments.

- Camera/player power switch ········Position of the player
- Connect the adjusting remote control unit to the remote terminal (PS-308 board J951).

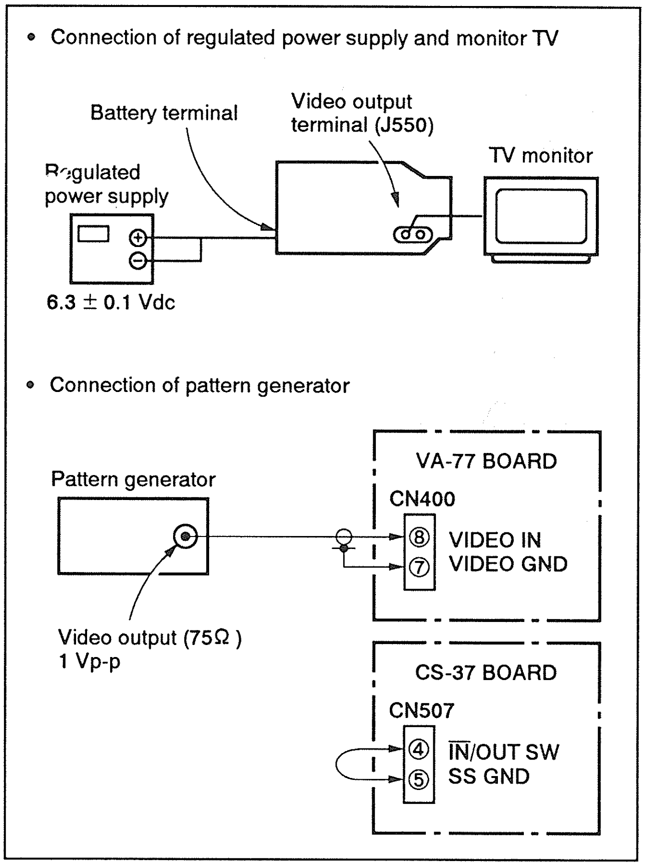

• Connection of regulated power supply and monitor TV
Battery terminal
Video output terminal (J550)
Regulated power supply
TV monitor
6.3 ± 0.1 Vdc
• Connection of pattern generator
Pattern generator
VA-77 BOARD
CN400
⑧ VIDEO IN
⑦ VIDEO GND
Video output (75Ω)
1 Vp-p
CS-37 BOARD
CN507
④ IN/OUT SW
⑤ SS GND

Fig. 9-1.

9-1-3. How to Set REC Mode

1. Release the protect of page D with the adjusting remote control unit.
   Page: 1, Address: 00, Data: 01
2. Select address 02 of page D.
3. Set data 49, and press the PAUSE button of the adjusting remote control unit.
4. Set the HOLD switch of the adjusting remote control unit to the NORMAL position.
5. Press the REC buttons to set up REC mode.

〔Processing after completing adjustments〕
1. Release the protect of page D.
   Page: 1, Address: 00, Data: 01
2. Set data 48 to page D, address 02, and press the PAUSE button of the adjusting remote control unit.

9-1-4. Precautions Upon Adjustment

- The MA-155 board (Mic amplifier) is not required for adjusting the video section.
- Remove the following connector if the focus hold button gets in the way.
  1. CN852 of CS-37 board (8 pins)

- Remove the two lens block installing screws and the following connectors if the lens block gets in the way.
  1. CN801 of the CS-37 board (18 pins)
  2. CN851 of the CS-37 board (20 pins)
  3. CN902 of the CD-96 board (5 pins)

- Use an extension cable when opening the VA-77 board.
  1. Between CN201 of VA-77 board and CN503 of CS-37 board.
     40 pins, 0.8 mm pitch extension cable (J-6082-168-A)
  2. Between CN202 of VA-77 board and CN504 of CS-37 board.
     20 pins, 0.8 mm pitch extension cable (J-6082-169-A)

- Use an extension cable when opening the CS-37 board, and when checking the operation of the mechanical section.
  1. Between CN502 of CS-37 board and FP-600 board.
     30 pins, 0.8 mm pitch extension cable (J-6082-167-A)

- If cabinet (R) gets in the way, remove the following connectors after setting to the forced POWER ON mode using the adjusting remote control unit.
  1. CN505 of the CS-37 board (16 pins)

[How to set the forced POWER ON mode]
1. Release the protect of page D with the adjusting remote control unit.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D.
3. When the power is turned on in the VTR mode, set data 02. (Set data 01 when the power is turned on in the CAMERA mode.)
4. Press the PAUSE button of the adjusting remote control unit.
5. Disconnect the main power supply (6.3V).

The forced POWER ON mode has been set by the above operations. Hereafter, when the main power is supplied, the power will turn on in the VTR mode (or CAMERA mode). As the position of the power supply switch (CAMERA/OFF/PLAYER) and the presence/absence of the power supply switch becomes unrelated, the cabinet (R) can be removed.
Be sure to release the forced POWER ON mode after completing repair/adjustment.

[How to release the forced POWER ON mode]
1. Release the protect of page D.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D, and set data: 00.
   (Forced POWER ON mode releasing)
3. Press the PAUSE button of the adjusting remote control unit.

9-1-5. Set-up during Adjustment

As the video signal obtained from the pattern generator is used as an adjustment signal during electric adjustments, ensure that this video input signal is within the specification. Connect the oscilloscope to pin ⑧ of CN400 on the VA-77 board, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66. The video signal (color bar) used for electric adjustments is shown in Fig. 9-2.

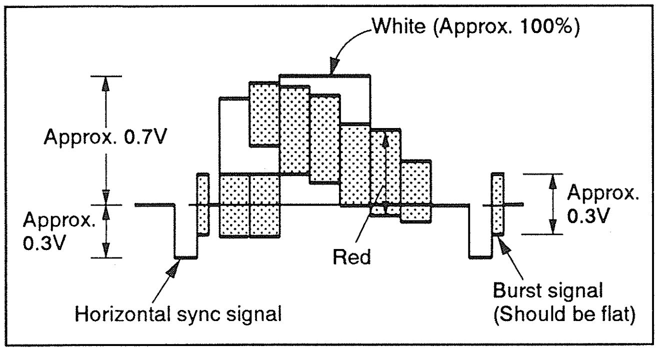


Fig. 9-2. Color Bar Signal of the Pattern Generator

9-1-6. Alignment Tape

The following table lists alignment tapes which are available.
Use the tape specified in the signal column for each adjustment.
If the type of tape to be used for checking operations is not specified, use whichever type.

Name	Record -ing mode	Tape type	Tape speed	Recording contents		Usage
				Video area	PCM area	
Tracking WR5-1NP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6N	L	MP	SP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5NSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. 400 Hz 20 sec. } Color bar section 14 kHz 20 sec. Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4NL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		

Note: Recording mode

L	Conventional mode
E	hi8 (hi band) mode

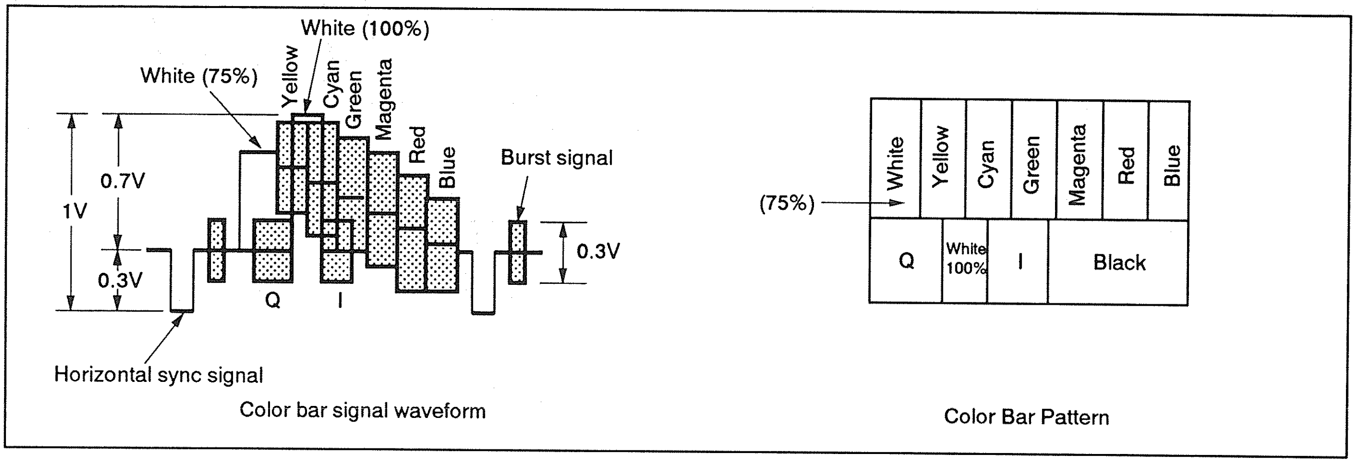
Tape type

MP	Particle type metal tape
ME	Evaporated type metal tape

Table 9-1.

Fig. 9-3. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure using the video output terminal (Terminated at 75 Ω)


White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst signal
0.7V
1V
0.3V
0.3V
Q
I
Horizontal sync signal
(75%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Q
White 100%
I
Black

Color bar signal waveform

Color Bar Pattern

Fig. 9-3. Color Bar Signals of the Alignment Tape

9-1-7. Output Level and Impedance

Video output	Pin jack Output signal: 1 Vp-p, 75 unbalanced, sync negative
Audio output	Pin jack Specified output: –7.5 dBs Output impedance: Below 2.2 kΩ

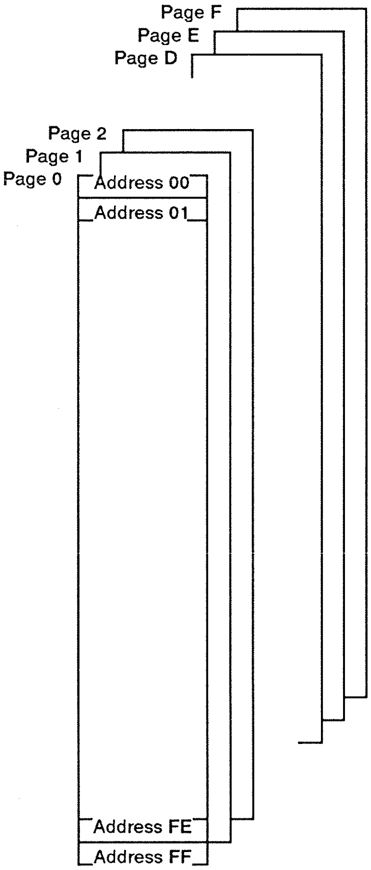
9-1-8. Service Mode

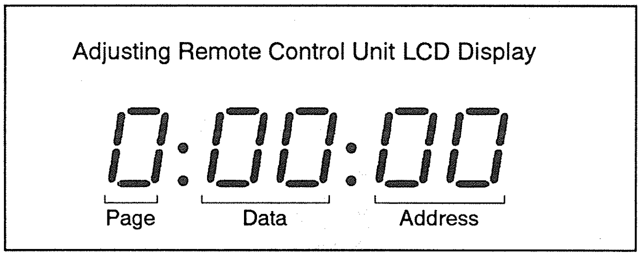
1. Setting the Service mode

The service mode consists of the adjustment mode which adjusts the EVR and the test mode which displays the condition of the unit.

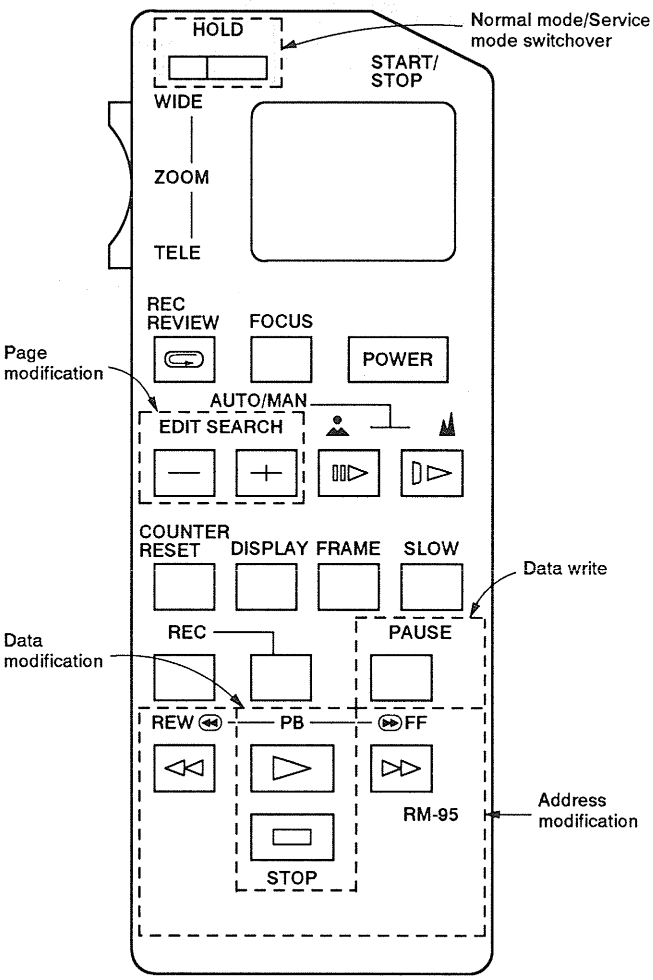
The unit can be shifted into the test mode and adjustment mode by connecting the adjusting remote control unit (set the HOLD switch to the HOLD side).

(1) Service LANC memory map


Page F
Page E
Page D
Page 2
Page 1
Page 0
Address 00
Address 01
Address FE
Address FF

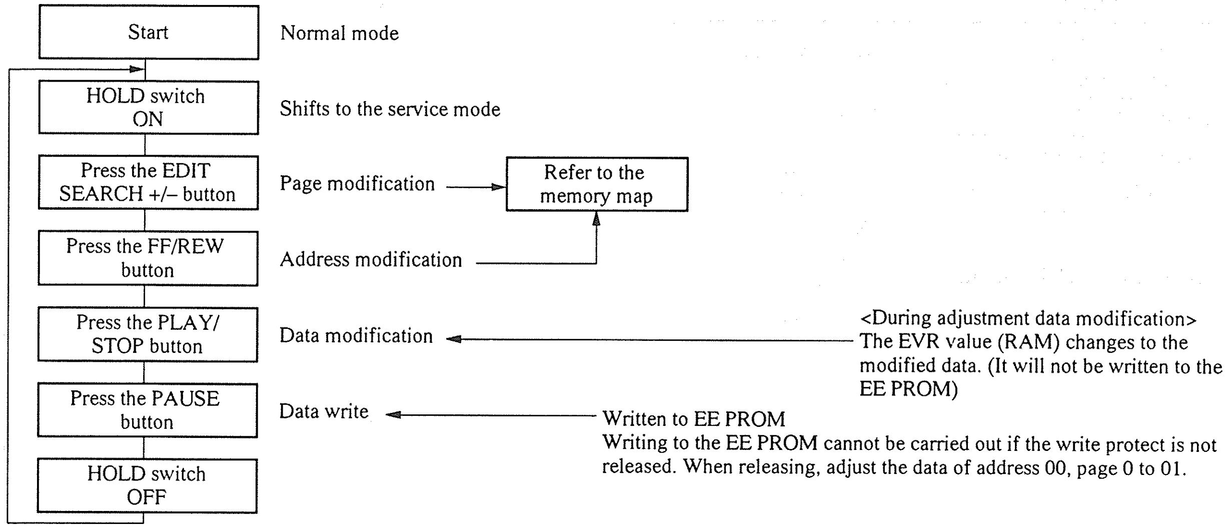

Adjusting Remote Control Unit LCD Display
0:00:00
Page
Data
Address

Adjusting remote control unit RM-95 (J-6082-053-A)


HOLD
Normal mode/Service mode switchover
START/ STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
Page modification
AUTO/MAN
EDIT SEARCH
COUNTER RESET
DISPLAY
FRAME
SLOW
Data write
REC
PAUSE
Data modification
REW
PB
FF
STOP
RM-95
Address modification

Page	Page allocation	Description
0	Not used	
1	Mode Control RAM, I/O	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2~4	Mechanical Control RAM, I/O	RAM and I/O memory area of the mechanical controller.
5	Not used	
6~8	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
9	Not used	
A	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
B, C	Not used	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is turned off. Releasing protect is required for changing data.
E	Not used	
F	Camera EE-PROM	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is turned off.

(2) Shifting to the Service Mode Using the Adjusting Remote Control Unit


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press the EDIT SEARCH +/– button
Page modification
Refer to the memory map
Press the FF/REW button
Address modification
Press the PLAY/ STOP button
Data modification
Press the PAUSE button
Data write
HOLD switch OFF

<During adjustment data modification>
The EVR value (RAM) changes to the modified data. (It will not be written to the EE PROM)

Written to EE PROM
Writing to the EE PROM cannot be carried out if the write protect is not released. When releasing, adjust the data of address 00, page 0 to 01.

Command Name	**Command Function**	**Normal LANC command**
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Direc Page Set	Sets the specified page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Write the data to the EE PROM. RAM	Pause

2. Types of Self-diagnostic Feature

MODE		Contents
TEST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
	Video, Audio adjustment	
ADJUST	Pass Adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergence is not detected except for TOP/END detection of the TAPE.
	Read of emergence code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

3. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Write protect release

4. Page F Write Protect

Release/set the page F write protect.

Page 6	Address 00

Data	Function
10	Normal (Write protect condition)
01	Write protect release

5. Test Mode Setting

Each type of test mode is set/released. Release the protect (page: 1, address: 00, data: 01), before setting the data.

Page D	Address 01

Data	Function
00	Normal
01	Test mode 1 Various emergency inhibition and release Drum, capstan, loading motor, reel, tape top, end, DEW SP/LP automatic distinction inhibition, manual switchover 5 minutes pause release inhibition Power off inhibition • release by battery end
02	Test mode 2 1'CH frequency response adjustment SP/LP automatic distinction inhibition, manual switchover
03	Test mode 3 Track shift Plays back the track shift Rear lock distinction inhibition during PB SP/LP automatic distinction inhibition, manual switchover
04	Test mode 4 Rear lock mode Rear lock playback is performed SP/LP automatic distinction inhibition, manual switchover
05	Test mode 5 SP/LP automatic distinction inhibition, manual switchover

※ This address data will be recorded on the non-volatile memory by pressing the PAUSE button on the adjusting remote control unit. Take note, as when this happens, the test mode will not be released even if the main power is turned off (6.3 Vdc).

※ Be sure to return the data of this address data to 00 after completing adjustments/repairs.

6. Emergency code

Troubles (errors) can be checked.

Page D	Address 06

First emergency code

……The first error code generated

Page D	Address 07

Last emergency code

…… The last error code generated (this data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after resetting the data.

Code	Error condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Other reel errors
04	Capstan error
05	DRUM FG error during drum start up
06	DRUM PG error during drum start up
07	DRUM FG error during drum regular condition
08	DRUM PG error during drum regular condition
09	DRUM Phase error during drum regular

7. Emergency mode

The operation mode during an error outbreak can be checked.

Page D	Address 08

First emergency mode
……The operation mode when the first error is generated

Page D	Address 09

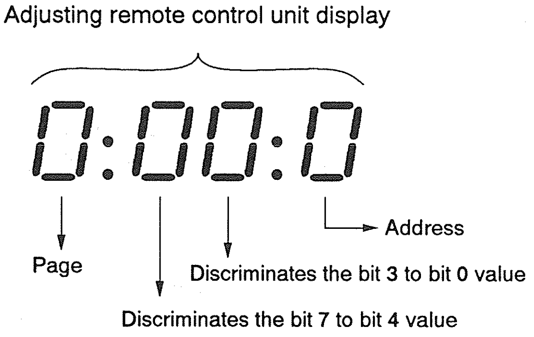
Last emergency mode
……The operation mode when the last error is generated
(This data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 08 and 09 to 00 after completing repairs/adjustments.
※ When rewriting data, be sure to press the PAUSE button of the remote control unit after setting the data.
※ Addresses 08 and 09 of page 0 and addresses 08 and 09 of page D have the same functions.

Code	Error condition
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
36	–X1
37	–1/5 SLOW
46	CUE
47	1/10 SLOW
56	REVIEW
57	–1/10 SLOW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
76	–X2
77	–FRAME
83	REWIND
85	REC REVIEW(+)
95	REC REVIEW(–)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH(–)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

8. Bit value Discrimination

It is necessary to discriminate the bit value by the adjusting remote control unit display data for the following items. Discriminate if the bit value is “1” or “0” using the following table.


Adjusting remote control unit display
0:00:0
Page
Address
Discriminates the bit 3 to bit 0 value
Discriminates the bit 7 to bit 4 value

	Remote Control Unit Display	Bit Value			
		bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ→	8	1	0	0	0
	9	1	0	0	1
	A (A)	1	0	1	0
	B (b)	1	0	1	1
	C (c)	1	1	0	0
	D (d)	1	1	0	1
Ⓑ→	E (E)	1	1	1	0
	F (F)	1	1	1	1

(Example) When the remote control unit display data is “8E”, the bit values of bit 7 to bit 4 can be discriminated from column Ⓐ, and that of bit 3 to bit 0 can be discriminated from column Ⓑ.

9. Check of Power Switch, Tape Distinction Switch, etc.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				$\overline{\text{REC PROOF}}$	ME/$\overline{\text{MP}}$	Hi8/$\overline{\text{Normal}}$	HG/$\overline{\text{Normal}}$

"1"=Recording impossible
"0"=Recording possible

"1"=ME tape
"0"=MP tape

"1"=HG tape
"0"=Others

"1"=Hi8 mode playback
"0"=Normal mode playback

Page 1	Address 23

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
					$\overline{\text{CC DOWN}}$		

"0"=During cassette compartment lock

10. RECOG SW Check

Page 1	Address 3D

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
V MUTE	A MUTE	VA PB MODE	JOG	PB CLOG	REC CLOG	SYNC DET	LP/$\overline{\text{SP}}$

"1"=LP mode playback
"0"=SP mode playback

"1"=SYNC is detected
"0"=SYNC is not detected

"1"=CLOG is detected
"0"=Normal

"1"=When the PB RF signals are being playback normaly
"0"=Others

"1"=JOG mode
"0"=Other

"1"=Playback mode
"0"=Others

"1"=AUDIO MUTE: ON
"0"=AUDIO MUTE: OFF

"1"=VIDEO MUTE: ON
"0"=VIDEO MUTE: OFF

11. Individual Operations of the Drum, Capstan, and Loading Motor

Page 4	Address 11

1) Adjust the mechanical section to the loading completion condition.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 0E.
   (Control permission from the adjusting remote control unit of the motor)
4) By setting the data in the following table to page: 4, address: 11, the corresponding motors can be operated individually.
5) After checking the operations, turn off the main power (6.3 Vdc).

Data	Operation
00	Normal
02	Drum forward rotation
04	Drum reverse rotation
06	Capstan forward rotation
08	Capstan reverse rotation
0A	Loading motor forward rotation
0C	Loading motor reverse rotation
03	All motors stop
05	
07	
09	
0B	
0D	
0F	

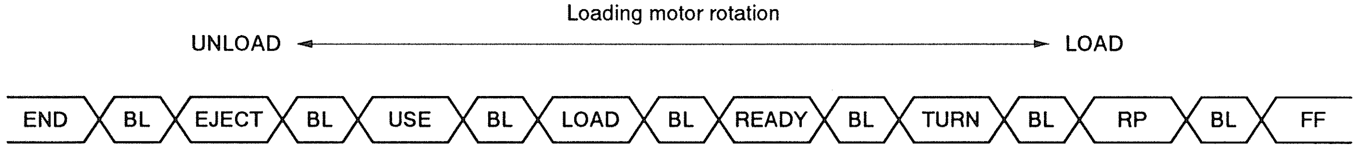
12. Mode Switch Check

The mode switch position (mechanical section condition) can be checked.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 0	MSW 1	MSW 2					

			POSITION	FUNCTION	$\overline{\text{CC DOWN}}$
0	0	0	BL	Interval of each position	
0	1	1	END	FULL END processing (T side lock removal)	1
0	0	1	EJECT	Cassette compartment ejection	1
1	0	1	USE	EJECTED (Unskate end)	1
0	0	1	LOAD	LOADING (Skate in)	0
1	0	0	READY	NORMAL STOP position	0
1	1	0	TURN	OFF of pinch roller only with PB ↔ REV (oscillating position)	0
0	1	0	RP	PB, REC, RVS, REV, REW	0
0	0	0	FF	FF/CUE	0



13. Mode control micro processor key matrix check

The key input can be checked.

Page 1	Address 68~6D

	Bit7	Bit6 (K IN 6)	Bit5 (K IN 5)	Bit4 (K IN 4)	Bit3 (K IN 3)	Bit2 (K IN 2)	Bit1 (K IN 1)	Bit0 (K IN 0)
Address 68 (K OUT 0)		BEEP ON/OFF	VTR POWER	EDIT SEARCH (+)	EDIT SEARCH (−)		START/STOP	STANDBY
Address 69 (K OUT 1)		AE PORTRAT	CAMERA POWER	ZERO MEMORY	COUNTER RESET	FF	REW	EJECT
Address 6A (K OUT 2)		AE SPORTS	REMOTE ON/OFF		TAPE/BATT CHECK	STOP	PLAY	EDIT ON/OFF
Address 6B (K OUT 3)		AE SHUTTER	EVENT	TIME	DATE	PAUSE		
Address 6C (K OUT 4)				BACK LIGHT	FADER			
Address 6D (K OUT 5)		AUTO FOCUS ON/OFF						

14. Wireless Remote Control Unit Reception Content Check

Page 1	Address 1E

Wireless remote control unit key pressed	Data
None	FF
TELE	9A
WIDE	9B
Start/stop	99
Rewind	1B
Fast forward	1C
Stop	18
Playback	1A
Data screen	5A
Pause	19
SLOW	23

15. Page D Address List

Note 1: The adjustment data initial value is the data to be input before performing video section adjustment (page D), when the page D data has been erased due to some cause.

Note 2: The data listed in the adjustment data memo column are the fixed data.
Check that these data have not been accidentally rewritten, after completing adjustments.

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	Category code	Not used	00	00
01	Test mode		00	00
02	Destination flag		49	48
03	BATT END	Battery end adjustment	90	
04	SW POSITION	SW POSITION adjustment	80	
05	SW POSITION	SW POSITION adjustment	0B	
06	EMERGENCY code (FIRST)	Error code and mode are memorized. Rewrite the data of these addresses to 00 after repairs/adjustments	00	00
07	EMERGENCY code (LAST)		00	00
08	EMERGENCY mode (FIRST)		00	00
09	EMERGENCY mode (LAST)		00	00
0A	SR DATA (MP NORMAL SP)	CXA1207 serial data	24	24
0B	SR DATA (MP NORMAL LP)	CXA1207 serial data	3E	3E
0C	SR DATA (ME Hi8 SP)	CXA1207 serial data	24	24
0D	SR DATA (ME Hi8 LP)	CXA1207 serial data	3E	3E
0E	SR DATA (ME NORMAL SP)	CXA1207 serial data	24	24
0F	SR DATA (ME NORMAL LP)	CXA1207 serial data	3E	3E
10	SR DATA (MP Hi8 SP)	CXA1207 serial data	24	24
11	SR DATA (MP Hi8 LP)	CXA1207 serial data	3E	3E
12	SR DATA (EDIT ON NORMAL)	CXA1207 serial data	24	24
13	SR DATA (EDIT ON Hi8)	CXA1207 serial data	3E	3E
14	CAM TITLE BLU R-Y	Camera titler color adjustment [Blue], not used		
15	CAM TITLE BLU B-Y	Camera titler color adjustment [Blue], not used		
16	CAM TITLE GRN R-Y	Camera titler color adjustment [Green], not used		
17	CAM TITLE GRN B-Y	Camera titler color adjustment [Green], not used		
18	CAM TITLE CYN R-Y	Camera titler color adjustment [Light blue], not used		
19	CAM TITLE CYN B-Y	Camera titler color adjustment [Light blue], not used		
1A	CAM TITLE RED R-Y	Camera titler color adjustment [Red], not used		
1B	CAM TITLE RED B-Y	Camera titler color adjustment [Red], not used		
1C	CAM TITLE VIO R-Y	Camera titler color adjustment [Violet], not used		
1D	CAM TITLE VIO B-Y	Camera titler color adjustment [Violet], not used		
1E	CAM TITLE YEL R-Y	Camera titler color adjustment [Yellow], not used		
1F	CAM TITLE YEL B-Y	Camera titler color adjustment [Yellow], not used		
20		X2MUTE, SIRCS EJECT etc	0C	0C
21		FORCED VTR ON, CAM ON etc DATA: MODE 01: FORCED CAMERA POWER ON 02: FORCED VTR POWER ON	00	00
22~2C		Not used		

Table 9-2 (1).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
2D	BATT REMAIN 1	Amount of remaining battery 1 } Battery end adjustment	A3	
2E	BATT REMAIN 2	Amount of remaining battery 2	9C	
2F	BATT REMAIN 3	Amount of remaining battery 3	97	
30~39		Not used		
3A	MT 1'CH	Not used [IC204 ④]	C0	C0
3B~42		Not used		
43	MT 1CH	1CH playback frequency characteristics adjustment [IC204 ②]	C0	
44		Not used		
45	MT 2CH	2CH playback frequency characteristics adjustment [IC204 ③]	C0	
46	REC C RF (EE)	REC C RF adjustment [IC203 ⑩]	62	
47	REC C RF (PB)	Playback REC C RF level [IC203 ⑩]	00	00
48	RF CONT (ME)	ATF RF level (ME) [IC204 ⑤]	77	77
49	RF CONT (MP)	ATF RF level (MP) [IC204 ⑤]	70	70
4A	EE LEVEL	EE level adjustment [IC203 ⑮]	6C	
4B		Not used		
4C	COMB ADJ	Chroma comb filter adjustment [IC203 ③]	A4	
4D	SR-IR	IR adjustment [IC203 ②]	A4	
4E		Not used		
4F	CARR	Y-FM carrier frequency adjustment [IC203 ⑤]	9B	
50		Not used		
51	DEV	Y-FM deviation adjustment [IC203 ⑥]	95	
52		Not used		
53		Not used		
54	REC Y (ME)	REC Y recording current adjustment (ME) [IC203 ⑦]	6F	
55	REC Y (MP)	REC Y recording current adjustment (MP) [IC203 ⑦]	6F	
56	REC Y (PB)	Playback REC Y level [IC203 ⑦]	00	00
57	PB Y (EE)	EE PB Y level [IC204 ⑮]	00	00
58	PB Y (E)	Hi8 PB Y level adjustment [IC204 ⑮]	CF	
59	PB Y (L)	Normal PB Y level adjustment [IC204 ⑮]	69	
5A	EMPH LVL (EE)	EE emphasis input level adjustment [IC203 ④]	81	
5B	EMPH LVL (PB)	Playback emphasis input level adjustment [IC203 ④]	93	
5C~77		Not used		
78	REC/PB MATRIX	Not used		
79		Not used		
7A	1.5 IR	1.5 MHz IR adjustment [IC204 ⑥]	72	
7B	1.5 DEV	1.5 MHz deviation adjustment [IC204 ⑦]	91	
7C	1.7 IR	Not used		
7D	1.7 DEV	Not used		
7E	AUDIO FADER	Audio fader [IC204 ⑩]		
7F~FF		Not used		

Table 9-2 (2)

9-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (PS-308 board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q952 collector
Measuring Instrument	Frequency counter
Specified Value	464 ± 5 kHz

Adjusting method:

1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (PS-308 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
EVF 5V check	
Measurement Point	Pin ⑥ of CN950
Specified Value	5.01 ± 0.15 Vdc
D5V check	
Measurement Point	Pins ⑰ and ⑱ of CN950
Specified Value	4.98 ± 0.15 Vdc
D4V check	
Measurement Point	Pins ⑮ and ⑯ of CN950
Specified Value	4.03+0.15 Vdc
VIDEO 5V check	
Measurement Point	Pins ② and ④ of CN950
Specified Value	5.01 ± 0.15 Vdc
SS 5V check	
Measurement Point	Pin ㉓ of CN950
Specified Value	5.02 ± 0.15 Vdc
AUDIO 5V check	
Measurement Point	Pin ⑧ of CN950
Specified Value	5.05 ± 0.15 Vdc
CAM5V check	
Measurement Point	Pins ⑬ and ⑭ of CN950
Specified Value	4.90 ± 0.15 Vdc
15V check	
Measurement Point	Pin ⑪ of CN950
Specified Value	15.04 ± 0.4 Vdc
–9V check	
Measurement Point	Pin ⑫ of CN950
Specified Value	–8.5 ± 0.4 Vdc

9-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to “Page D address list” in “9-1-8. Service Mode”.

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 7D

Input method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address.
   (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote control unit before changing the address.)

2. Battery End Adjustment

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	03 (BATT END) 2D (BATT REMAIN 1) 2E (BATT REMAIN 2) 2F (BATT REMAIN 3)

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-4.

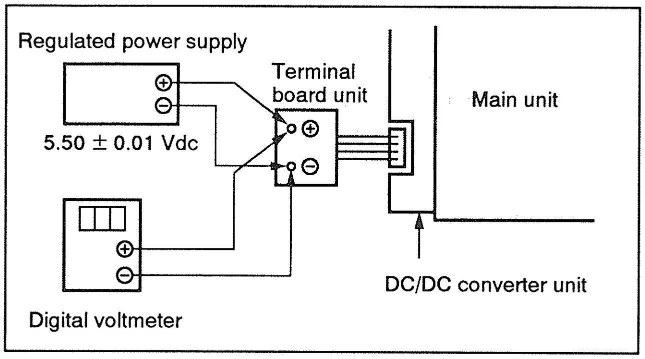


Fig. 9-4.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 01.
   (Test mode 1 setting)
4) Decrease the output voltage of the regulated power supply so that the digital voltmeter display is 5.50 ± 0.01 Vdc.
5) Select page: 4, address: 10, read the adjusting remote control unit display data, and set to D_{10}.
6) Set data D_{10} to page: D, address: 03, and press the PAUSE button of the adjusting remote control unit.
7) Convert D_{10} to decimal to obtain D_{10}'. (Refer to Table 7-6. "Hexadecimal notation – decimal notation conversion table")
8) Obtain the adjustment data (decimal) by following formula (decimal notation calculation), convert to hexadecimal and enter the data into each adjustment address.
   Address: 2D $D_{2D}'=D_{10}'+18$
   Address: 2E $D_{2E}'=D_{10}'+14$
   Address: 2F $D_{2F}'=D_{10}'+8$

   Note: After setting the data, be sure to press the PAUSE button of the adjusting remote control unit before changing the address.
9) Set data: 00 to page: 4, address: 01.
   (Test mode 1 release)
10) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-4.

Checking method:

Remove the adjusting remote control unit, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.70 ± 0.01 Vdc.
4) Check that the 🪫 mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
5) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.58 ± 0.01 Vdc.
6) Check that the 🪫 mark and the TALLY lamp on the EVF display on the EVF display blinks every second.
7) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.42 ± 0.01 Vdc.
8) Check that the 🪫 mark and the TALLY lamp on the EVF display are blinking faster, the VTR stops and the power supply turns off.

9-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (CS-37 board)

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1NP)
Measurement Point	CH1: Pin ④ of CN001 (RF SWP) CH2: Pin ③ of CN001 (PB RF CH2)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) (LOW) 05 (SW POSITION) (HIGH)
Specified Value	$t_1=0 \pm 10$ μsec

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 0B to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Change the data of page: D, address: 04, and adjust so that the switching position (t_1) becomes the specified value. (Fine adjustment)
5) Press the PAUSE button of the adjusting remote control unit.

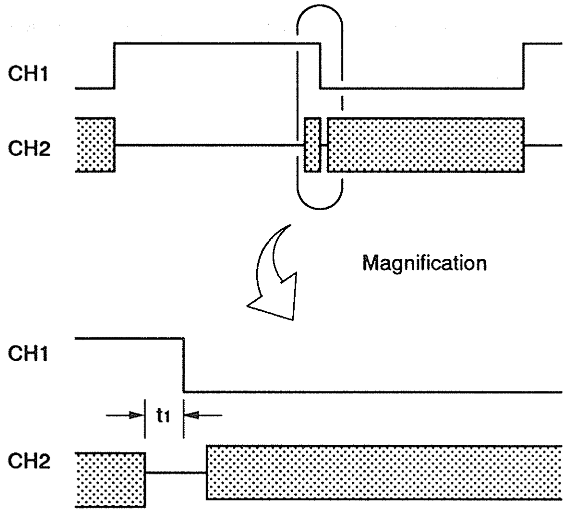


Fig. 9-5.

9-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Fig. 9-2.

[Adjusting procedure]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) EE level adjustment
5) IR adjustment
6) Chroma comb filter adjustment
7) Emphasis input level adjustment
8) PB Y level adjustment
9) PB LINE OUT level adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis f0 adjustment
13) REC Y level adjustment
14) REC C RF level adjustment
15) REC ATF level check

1. Playback Frequency Characteristic Adjustment (CS-37 board)

Note 1: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6N)
Measurement Point	CH1: Pin ③ of CN001 EXT TRIG: Pin ④ of CN001
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [–]
Adjustment Page	D
Adjustment Address	43 (MT 1CH) [45 (MT 2CH)]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Confirm that the EDIT switch is OFF position.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Change the data of address: 43 [45] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.
   Note 2: After each address adjustment, be sure to press the PAUSE button of the adjusting remote control unit and memorize the data.
   Note 3: If the waveform is not stable, set data: 03 to page: 4, address: 01. (Test mode 3 setting)
   After completing adjustment, set data: 00 to page: 4, address: 01.

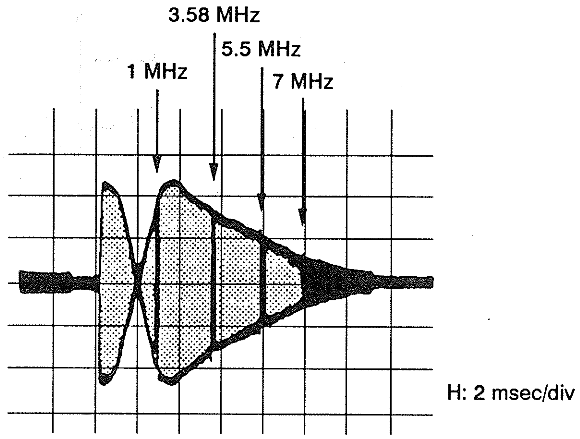


Fig. 9-6.

2. Flying Erase Check (CS-37 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ② of CN002 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Above 7.0 MHz Voltage: Above 7.0 Vp-p

Note: Use a MP type tape.

Checking method:

1) Check that the oscillation frequency is above 7.0 MHz and that the oscillation voltage is above 7.0 Vp-p.

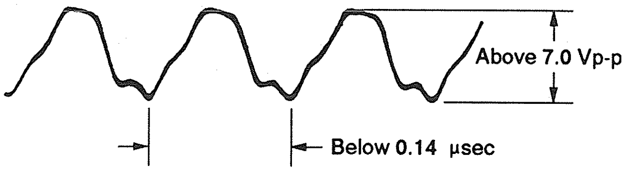


Fig. 9-7.

3. VXO Oscillation Frequency Check (VA-77 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑫ of IC301
Measuring Instrument	Frequency counter
Specified Value	3579545 ± 70 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin ⑫ of IC301 is 3579545 ± 70 Hz.

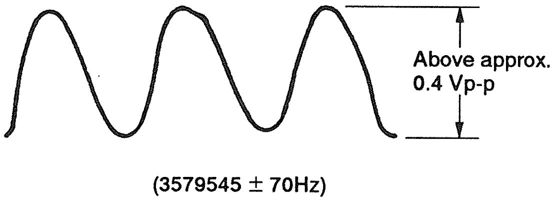


Fig. 9-8.

4. EE Level Adjustment (VA-77 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ③ of CN400 (VIDEO OUT)Note
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (EE LEVEL)
Specified Value	A=1.00 ± 0.025V

Note: Terminate pin ③ of CN400 at 75 Ω .
After completing adjustments, remove the 75 Ω resistor.

Adjusting method:

1) Release the protect.
Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

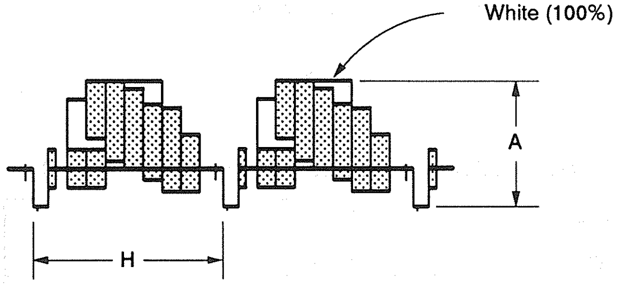


Fig. 9-9.

5. IR Adjustment (VA-77 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of IC201 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (SR IR)
Specified Value	Residual chroma component (A) is minimum (below 80 mVp-p)

Connection

1) Connect pin ⑭ of IC201 (or pin ② of IC205) to pin (51) of IC201 with a jumper wire.

Adjusting method:

1) Release the protect.
Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4D, and adjust so that the residual chroma component (A) becomes minimum.
3) Press the PAUSE button of the adjusting remote control unit.

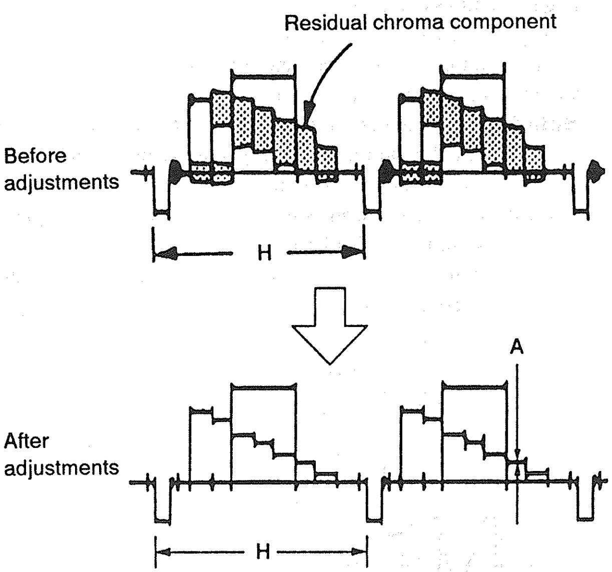


Fig. 9-10.

6. Chroma Comb Filter Adjustment (VA-77 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑪ of IC201 (C+CD)
Adjusting Element	Oscilloscope
Measuring Instrument	RV051 (Phase)
Adjustment Page	D
Adjustment Address	4C (C COMB)
Specified Value	Residual chroma component (A) is minimum.

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4C, and adjust the residual chroma component to minimum.
3) Adjust RV051 so that the residual chroma component (A) becomes minimum.
4) Repeat steps 2) through 3).
5) Press the PAUSE button of the adjusting remote control unit.

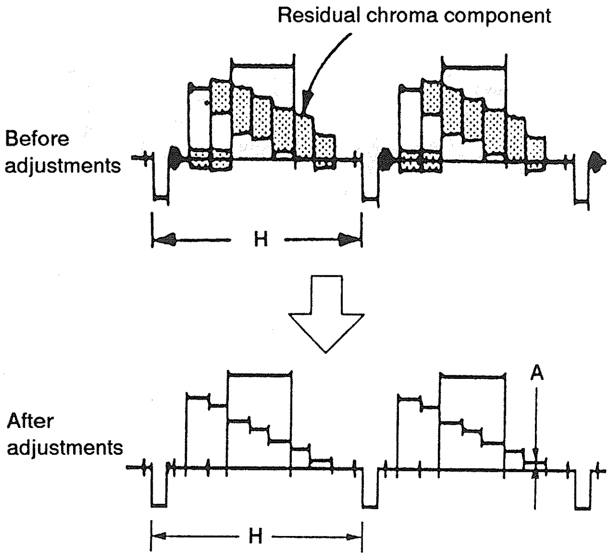


Fig. 9-11.

7. Emphasis Input Level Adjustment (VA-77 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑤ of IC206 (or Pin ③ of IC201)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPH LVL (EE))
Specified Value	A=0.50 ± 0.025V

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

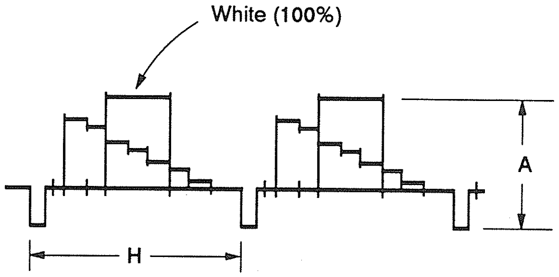


Fig. 9-12.

8. PB Y Level Adjustment (VA-77 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	59 (PB Y (L))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Playback the color bar section of the normal mode alignment tape (WR5-5NSP).
3) Change the data of page: D, address: 59, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

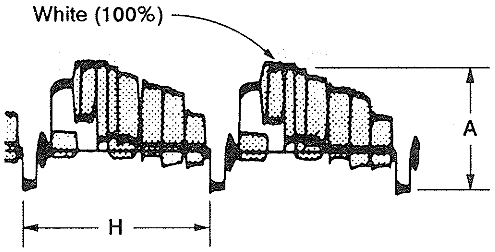


Fig. 9-13.

9. PB LINE OUT Level Adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video output terminal (terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (EMPH LVL (PB))
Specified Value	A=1.0 ± 0.05V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5B, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

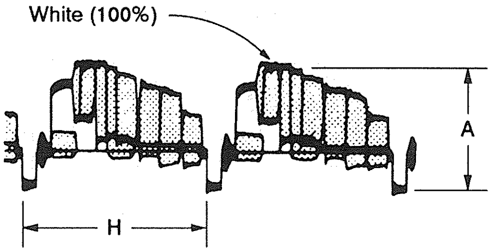


Fig. 9-14

10. Y FM Carrier Frequency Adjustment (VA-77 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ㊸ of IC201 (Y RF OUT)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (Y FM CARRIER)
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4F, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Perform "Deviation Adjustment".

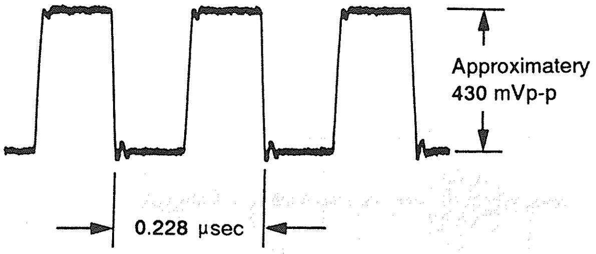


Fig. 9-15.

11. Deviation Adjustment (VA-77 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (Y FM DEVIATION)
Specified Value	A=0.50 ± 0.025V

Note: Check that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.50 ± 0.025V
5) If the specification is not satisfied, change the data of page: D, address: 51, and repeat steps 2 to 4.

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote control unit.

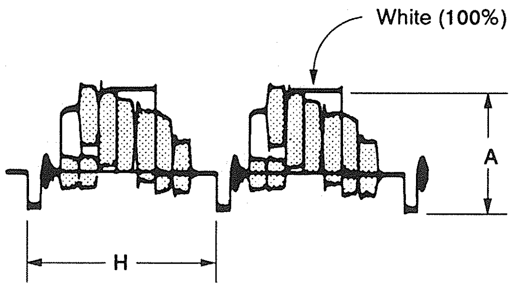


Fig. 9-16.

12. Chroma Emphasis f0 Adjustment (VA-77 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ㉔ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	FL302
Specified Value	Minimum f0 component

Adjusting method

1) Adjust FL203 so that the amplitude of the latter section of the chroma signal (yellow section) becomes minimum.

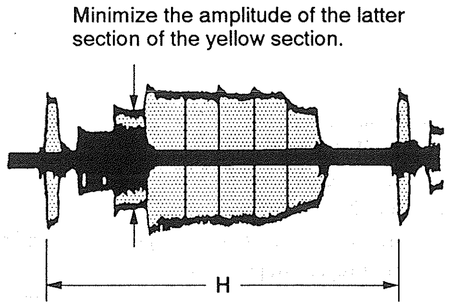

Minimize the amplitude of the latter section of the yellow section.
H

Fig. 9-17.

13. REC Y Level Adjustment (VA-77 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑤ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	55 (REC (MP)), 54 (REC Y (ME))
Specified Value	A=220 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 55, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Set the same data of address: 55 to address: 54.
5) Press the PAUSE button of the remote control unit.

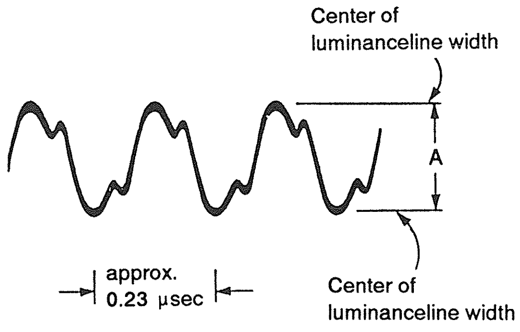


Fig. 9-18.

14. REC C RF Level Adjustment (VA-77 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ③ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	46
Specified Value	A=110 ± 10 mVp-p

Note: Use a MP type tape.

Adjusting method

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 46, and adjust so that the chroma signal level (A) becames the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

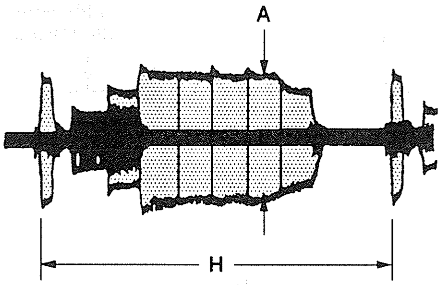


Fig. 9-19.

15. REC ATF Level Checking (CS-37 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑱ of IC501
Measuring Instrument	Oscilloscope
Specified Value	A=600 ± 30 mVp-p

Checking method

1) Confirm that the REC ATF signal level (A) satisfies the specified value.

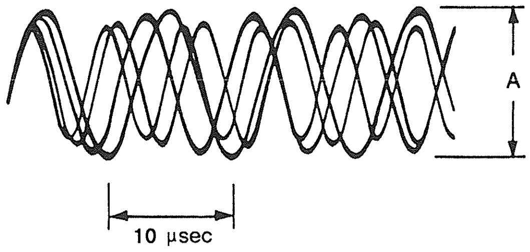


Fig. 9-20.

9-6. AUDIO SYSTEM ADJUSTMENT

- Perform the adjustment using the color bar signal as a video signal input.

[Connecting the measuring instruments for the audio]
Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 9-21, and perform adjustments with the power switch [player] position.

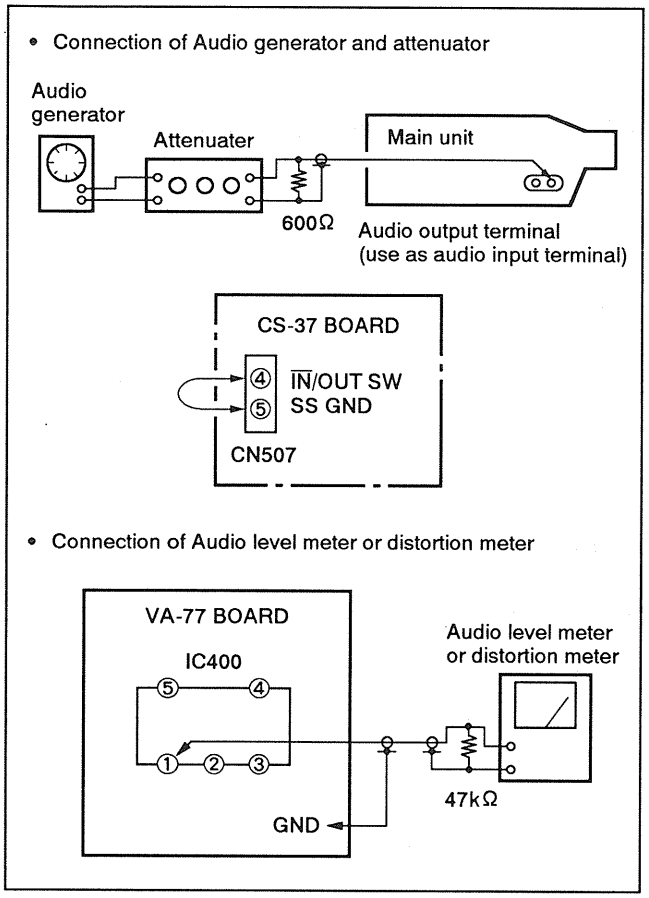

• Connection of Audio generator and attenuator
Audio generator
Attenuater
Main unit
600Ω
Audio output terminal
(use as audio input terminal)
CS-37 BOARD
④ IN/OUT SW
⑤ SS GND
CN507
• Connection of Audio level meter or distortion meter
VA-77 BOARD
IC400
⑤
④
①
②
③
GND
Audio level meter
or distortion meter
47kΩ

Fig. 9-21.

[Adjustment Procedure]

1) Carrier frequency check
2) Recording level check
3) E-E output level check
4) IR adjustment
5) Deviation adjustment
6) Overall level characteristics, distortion check
7) Overall noise level check

1. Carrier Frequency Check (VA-77 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:

1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

2. Record Level Check (VA-77 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	A=340 ± 40 mVp-p

Checking method:

1) Check that the 1.5 MHz carrier level satisfies the specified value.
(Read the center of the luminance line width and note down the level read.)

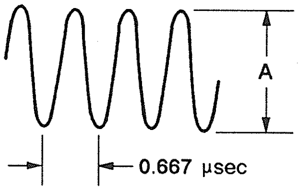


Fig. 9-22.

3. E-E Output Level Check (VA-77 board)

Mode	Record
Signal	400 Hz, –7.5 dBs audio input terminal
Measurement Point	Pin ⑲ of IC401 or Pin ① of IC400
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (–7.5 ± 2 dBs)

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

4. IR Adjustment (VA-77 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP)
Measurement Point	+: Pin ⑥ of IC401 –: Pin ㊹ of IC401 (C428 ⊕)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	7A (1.5 IR)
Specified Value	The DC voltage difference between pins ㊹ and ⑥ is 0 ± 10 mVdc

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7A and adjust so that the DC voltage becomes 0 ± 10 mVdc.
3) Press the PAUSE button of the adjusting remote control unit.

5. Deviation Adjustment

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5NSP)
Measurement Point	Audio output terminal
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7B (1.5 DEV)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:
1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7B, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

6. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –7.5 ± 2 dBs Distortion rate: Below 0.5% (Note 1)

Note: 1) Value when the following filter is used

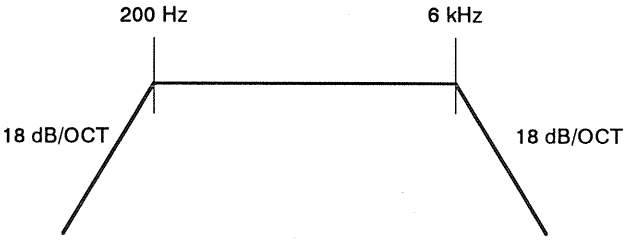


Fig. 9-23.

Checking method:
1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal.
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal is –7.5 ± 2 dBs, and that the distortion rate is below 0.5% (Note 1).

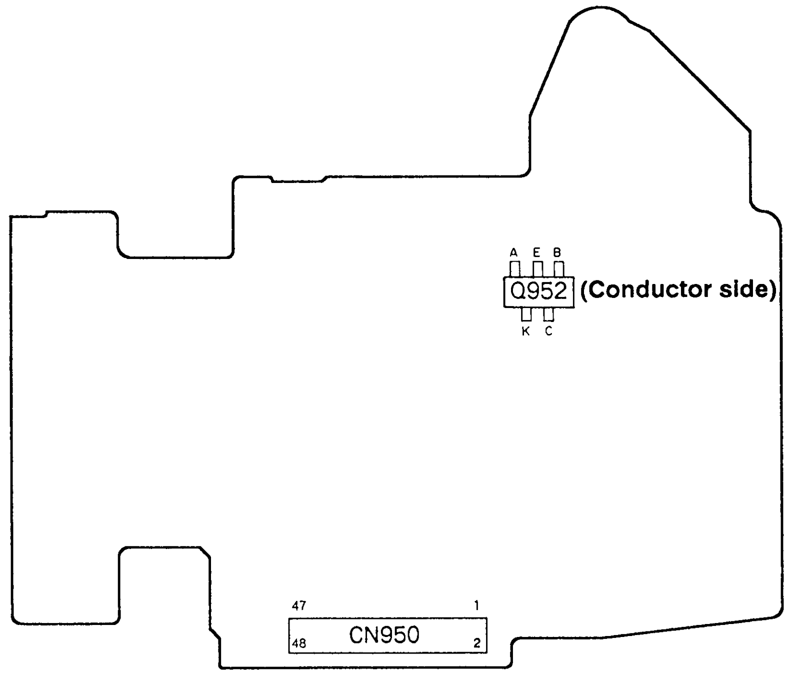
7. Overall Noise Level Check

Mode	Self recording
Signal	No signal: Audio input terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –65.0 dBs

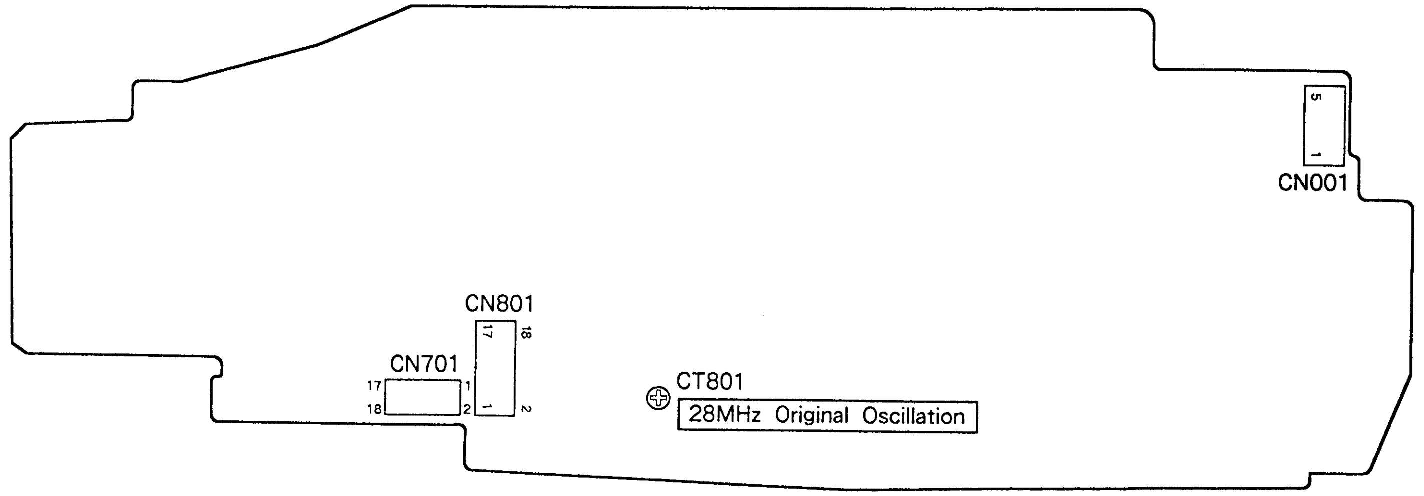
Checking method:
1) Remove the audio input signal.
2) Record.
3) Playback the recorded section.
4) Check that the noise level of the audio output terminal is below –65.0 dBs.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

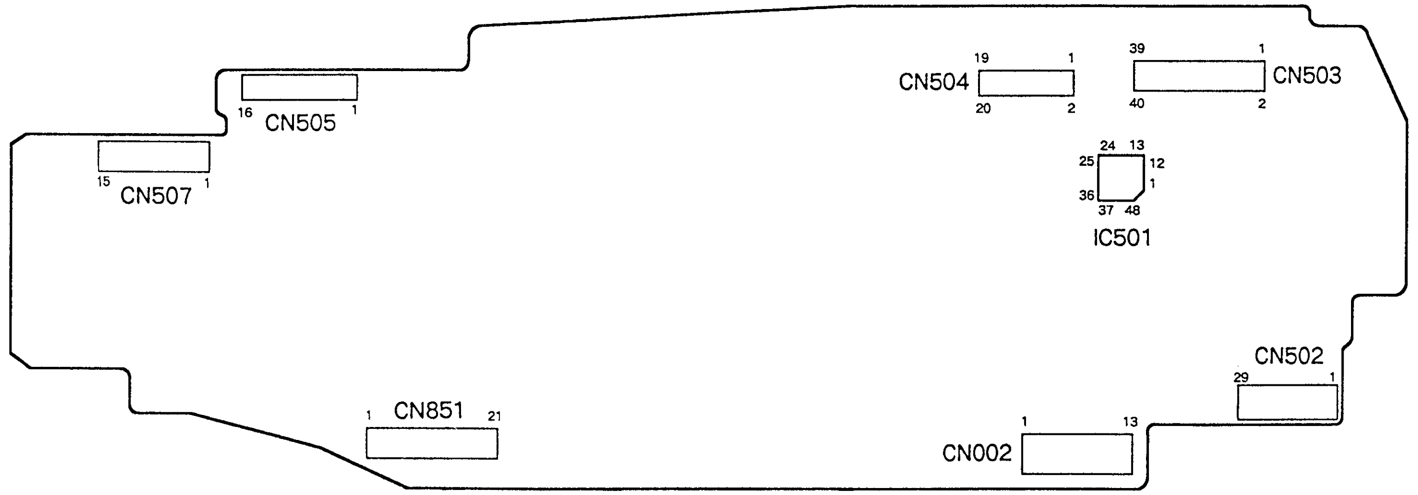
PS-308 BOARD (COMPONENT SIDE)


A E B
Q952 (Conductor side)
K C
47 1
CN950
48 2

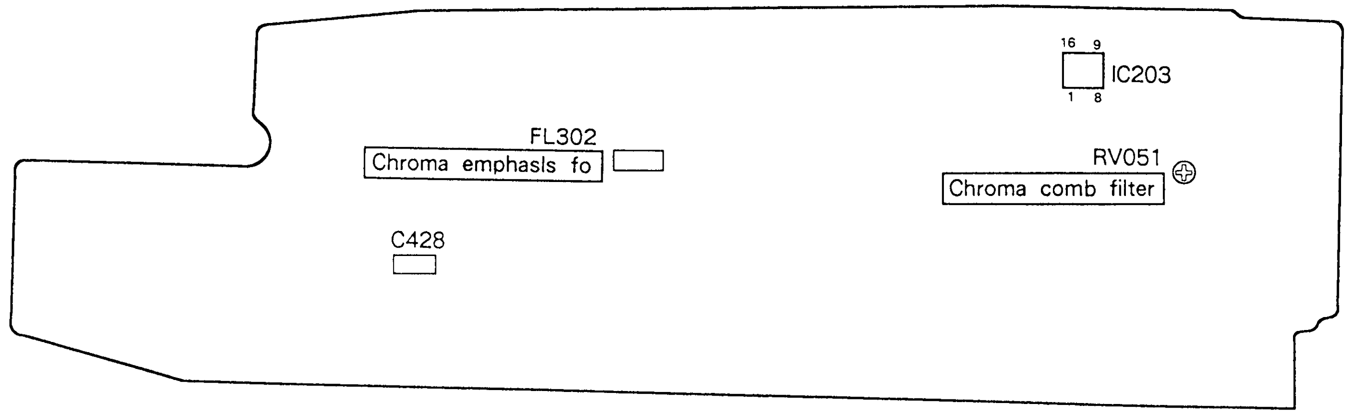
CS-37 BOARD (COMPONENT SIDE)


CN001
CN801
CN701
CT801
28MHz Original Oscillation

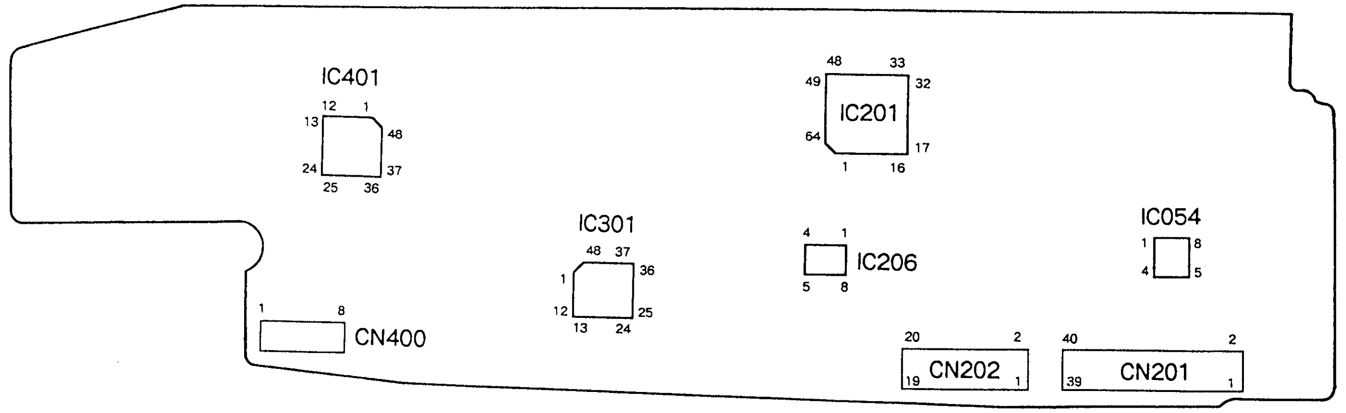
CS-37 BOARD (CONDUCTOR SIDE)


CN505
CN507
CN504
CN503
IC501
CN502
CN851
CN002

VA-77 BOARD (COMPONENT SIDE)


IC203
FL302
Chroma emphasis fo
RV051
Chroma comb filter
C428

VA-77 BOARD (CONDUCTOR SIDE)


IC401
IC201
IC301
IC206
IC054
CN400
CN202
CN201